BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE PAMPHLET 32-1010

1 NOVEMBER 1998

Civil Engineering

LAND USE PLANNING

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Supersedes AFP 86-7, 15 March 1988.

Pages: 101
Distribution: F

This pamphlet supports implementation of AFPD 32-10, *Air Force Installations and Facilities* and AFI 32-70, *Environmental Quality.* It replaces AFP 86-7, *Land Use Planning*, published in 1988. This release reformats the initial bulletin but does not significantly alter its organization or content. The pamphlet focuses on the installation's need to organize, adopt and implement processes, concepts and land use alternatives prescribed in AFI 32-7062, *Comprehensive Planning.* **Attachment 1** is a list of references used in preparing this phamplet.

SUMMARY OF REVISIONS

This is the initial publication of AFPAM 32-1010. This pamphlet continues the original pamphlets scope as the source document for installation land-use planning guidance. It describes the land use planning data management, goals development, and issue resolution processes. It details land use alternatives-development, analysis, selection, and implementation tools. It is responsive to local land use analysis needs and long range mission planning opportunities.

Chapter 1

THE LAND USE PLANNING PROCESS

Section 1A—What is Land Use Planning?

1.1. The Planning Concept. Planning has often been referred to as organized common sense. It is something we do every day as a natural part of our lives. In the planning process we must devise a specific course of action to follow over a period of time in order to achieve specific goals.

1.2. Planning Process and Product.

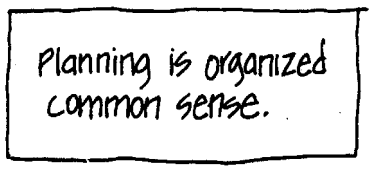
1.2.1. Process. The planning process consists of an organized decision-making system that ensures that specific actions (i.e., programs, policies, buildings, legislation, etc.) are directed toward achieving agreed-upon goals and objectives. The process can also be used to modify the plan when new information or changed conditions indicate that changes are required.

1.2.2. Product. The product of planning is the plan, an expression in written and graphic form of a desired end-state to be achieved at some future date. The plan contains a set of coordinated goals and objectives and the general outline and characteristics of the desired end-state.

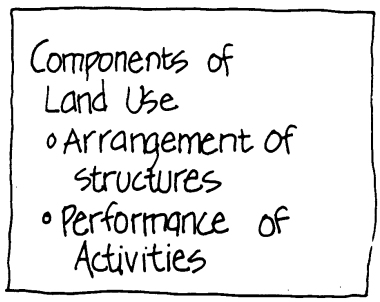
1.3. Planning Organization.

1.3.1. As an organized way of thinking about spatial, functional, social, and economic problems, planning is oriented predominantly toward the future, is deeply concerned with the relation of goals to individual and collective decisions, and strives for comprehensiveness in policies and programs.

1.3.2. Mission Support. The central question addressed by land use planning is: "How are activities to be distributed so as to meet stated objectives?"



1.3.3. To plan effectively, the planner needs to know the organization's goals, the available resources, and the factors that may constrain or facilitate the achievement of the plan.



1.3.4. Analysis and Logic. The process component of land use planning includes the analysis and logic process used to develop this future vision. The product side of land use planning includes the creation of a graphic representation of how the installation should develop, based on local goals, requirements, and a strategic perspective of its future mission needs.

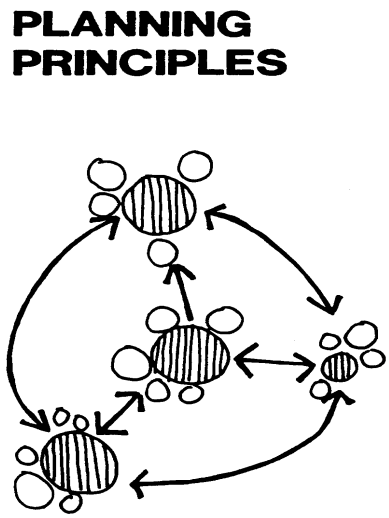
1.3.5. Built and Natural Environments . Land use planning must effectively integrate the physical elements of a base--the built and natural environments--and the human activities that take place within and around the physical elements of the base. This human element is the socio-cultural environment. It includes working and daily living activities performed on the base. An important point to remember: Land use planning is not simply the grouping of all similar uses and facilities together in clusters; it is the arrangement of compatible activities in the most functionally effective and efficient manner. For example, military family housing areas, although shown as a single major land use category, may also include a shoppette childcare center, recreational areas, and other complementary uses. Building placement and organization are important insofar as they enhance (or detract from) the effectiveness with which missions are accomplished and the quality of life at the base.

1.3.6. Planning Outside the Base . Planning inside and outside the base requires near and long-term land development perspectives. Routine updates of the commander's goals and objectives, the aspirations of local community leaders, and what will be planned for the future is the basis for planning. The initiation of mutually beneficial land use commitments evolves from the commander's participation in or creation of grass-roots associations with local government and commerce leaders.

1.4. The Installation Community.

1.4.1. Planning Principles. The structure of the base can be defined as a system of nodes (concentrations of compatible activities) and functional linkages.

Figure 1.1. Activity Nodes and Linkages.



1.4.1.1. Nodes are arranged according to associated activities **(**Figure 1.1.) It is the relationship between activities that determines the proximity of one node to another.

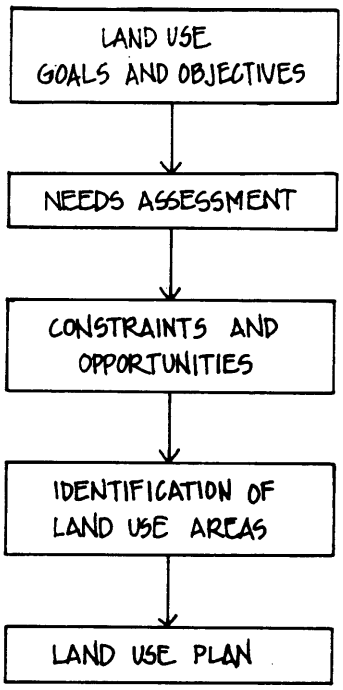
1.4.2. The existing base structure is a function of historic development, place, mission, and military strategy. The array of land uses and the location of buildings, streets, and utilities evolved over time,

as missions changed and needs evolved. The placement of activities also responded to the physical and natural environments that existed when each use was developed. The location of infrastructure, the proximity of functionally related activities, and the opportunities/constraints imposed by the natural environment all combined to determine the arrangement of structures and activities.

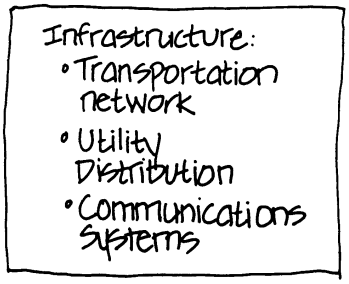
1.5. Differences Between Installations.

1.5.1. Land use organization and functional relationships at any two Air Force installations will likely vary according to differences in mission, historic character, and the natural and built environments. A basic land use pattern may be evident but each will differ for a number of reasons.

Figure 1.2. Land Use Planning as a Rational Process.



1.5.2. Land Use Planning as a Way of Thinking. A central idea to be communicated in this bulletin is that land use planning is a way of thinking and, a way of organizing. While solutions for particular problems will undoubtedly have prototypes elsewhere (e.g., the use of cluster development for housing), the mix of land use solutions at a particular installation will be unique.



1.6. Planning Phases.

1.6.1. Land use planning is a rational, sequential decision-making process. It is rational in its orderly approach **(Figure 1.2.)**. Land use goals and objectives for an Air Force installation are first identified and drafted. This is followed by an assessment of needs, with full consideration of the unique constraints and opportunities that exist at that particular base. The information collected is then used to develop a future land use plan clearly identifying areas by functional use. Finally, the plan is used to guide future development. The planning process must be a dynamic one, capable of accommodating change, when change dictates. A plan must be amended, not abandoned.

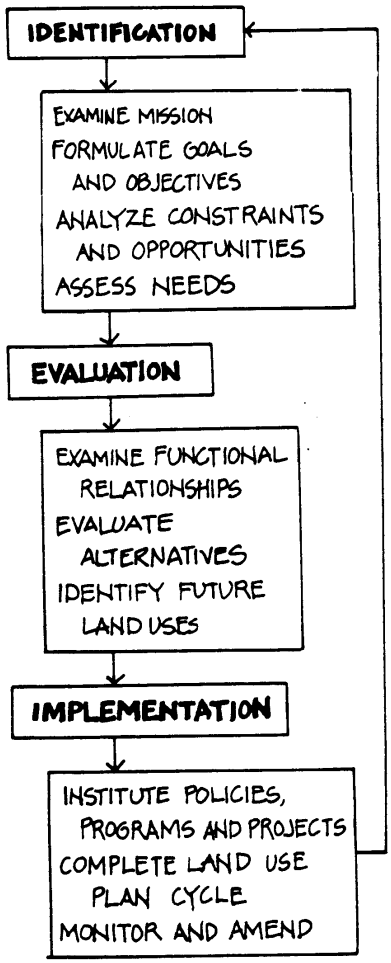
1.6.2. Land use planning is sequential in that it is performed through a series of well-defined steps that comprise the process. These steps proceed from an inherent logic, often from the general to the specific:

1.6.2.1. Identification.

1.6.2.2. Evaluation.

1.6.2.3. Implementation.

Figure 1.3. Planning Process.



1.6.3. During the identification phase the base planning team must:

1.6.3.1. Define the installation's goals and objectives consonant with its Air Force mission and analyze those of the surrounding region. Conceptualize needed programs. This would include future mission changes driven by resource realignments or restructuring.

1.6.3.2. Develop a comprehensive profile of the base, including existing land use, cultural and natural resources, local infrastructure, and socio-demographic characteristics.

1.6.3.3. Determine constraints and opportunities by conducting a needs-assessment to identify the installation's problems and requirements.

1.6.4. Evaluation. In the evaluation phase, information is analyzed and used in shaping the future land use plan:

1.6.4.1. Analyze functional relationships within the existing land use pattern.

1.6.4.2. Include future facility requirements as well as future Air Force plans.

1.6.4.3. Compare the functional relationships analysis with the constraints and objectives identified earlier to determine the most suitable configuration.

1.6.4.4. Develop alternative future land use concept plans, and evaluate the relative strengths and weaknesses of each. Via the interactive planning process, develop the future land use map as the "chosen alternative."

1.6.4.5. Prepare the recommended future land use plan.

1.6.5. Implementation. During the implementation phase, detailed policies and programs are developed to implement the plan. These activities include the following:

1.6.5.1. Development of specific policies, programs, and projects that respond to the land use goals and objectives, achieve the desired land use pattern, and maintain consistency with the other comprehensive plan components.

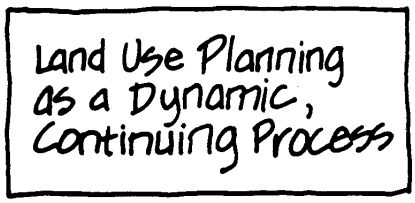
1.6.5.2. Incorporation of the land use plan into the comprehensive plan. Examine the long-range facilities development plan and the short-range capital improvement plan to ensure consistency.

1.6.5.3. Ensuring that all facility sitings are consistent with the future land use plan

1.6.5.4. Amending goals and objectives, needs assessment, and policies, programs, and projects in light of changing conditions.

1.6.6. Feedback. The land use planning process is an iterative one in that feedback is used to continually reassess decisions made earlier. For example, an installation's detailed evaluation of constraints and opportunities may require redefinition of the goals and objectives of the land use plan. Changes in goals and objectives should result in changes in policy. Similarly, as development occurs on base, the needs assessment may need modifications to take into account improvement in the land use pattern.

1.6.7. The planning process involves incorporating ideas from base users and residents as to how the base could best be laid out, what renovation is needed, and how functional relationships among and within land uses can be enhanced to foster a more efficient and effective environment within which to work and live.

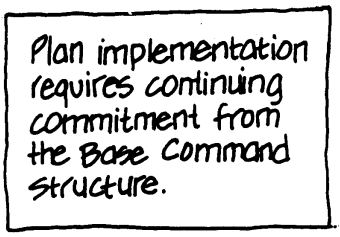


1.6.8. Land use planning is a dynamic process that must not stop once a plan has been approved. It is used on a continuing basis to determine facility siting and provide input into the facility development and capital improvement plans.

Section 1B—Who is Involved?

1.7. Commander and Facilities Board, and EPC . Ultimate responsibility for base development rests with the installation commander, who relies on the base facilities board for recommendations regarding development decisions. The base environmental protection committee (EPC) is also a good source of planning input.

1.8. The Base Civil Engineer (BCE). The BCE is responsible for executing the planning process and developing the land use plan for approval by the installation commander and the facilities board. The planning staff, primarily the base community planner, is the focal point for developing the plan. The planner, however, does not and cannot develop the land use plan in isolation, but must obtain, coordinate, and consolidate information and inputs from a number of sources, both within and outside the BCE organization. Early participation and review by key BCE personnel from the programming (contract planning), engineering and technical design, real estate, and operations and maintenance sections are particularly important. Each has knowledge and experience in technical areas that must be considered if the final plan is to be reliable and realistic.



1.9. Residents and Employees.

1.9.1. A land use plan influences how well an installation will operate and function now and in the future. It is therefore vital that the plan be developed by soliciting and considering the opinions and ideas from the installation's individual organizations, the residents, and workers. These individuals may be able to provide a perspective related to the specifics of their operations, or based on their experience, highlight an issue that could affect a land use determination. Air Force criteria and standards have a major influence on land use determinations, and agencies whose functions are governed by them should be contacted; e.g., Base Safety Office and Airfield Management just to name two. In some cases local government agencies and officials could be contributors to the land use development process. The present community and command structure need to adopt and support the plan based on known and anticipated future mission opportunities for it to be successful. However, to be enthusiastic and supportive, the work force and residents need to feel that their perspective, ideas, and comments were given a fair consideration when the plan was developed. People who labor in the work spaces, travel the roads, live in the housing, and use the community facilities confront problems daily. They have a valuable collective perception of needs and what land use arrangements may be successful now and in future patterns of facility growth. Involve these people. Solicit their comments and insightful perspectives. Hold open meetings. Keep people posted on future goals and plan alternatives.

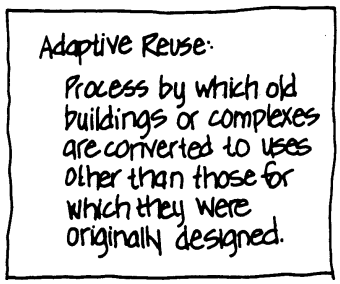
1.9.2. The concepts of good planning need to be fostered to become part of people's way of looking at the installation and the activities going on there. The broadest involvement in the planning process will obtain the broadest support and understanding for the plan during its implementation phase.

Section 1C—The Role of the Land Use Plan

1.10. Guide for Decision-Making.

1.10.1. The land use plan is a written and graphic guide to achieving long-term installation goals. It is the basis for judging each siting proposal, demolition, or activity relocation proposed at the installation. A land use plan charts a course of action to achieve specific, written goals. While it is true that this involves the thoughtful ordering of structures, it extends well beyond this to include how space is used.

1.10.2. The role of a land use plan is to be the physical basis upon which to make the best use of installation resources. The plan gives a context to decisions. It works to stave off short-term solutions to pressing needs which may appear reasonable at the time, but which create or fail to solve long-term problems. The plan gives a basis for going through an implementation phase that may have periods of inaction built into it, since all goals cannot be achieved instantly. For example, a vacant area adjacent to two existing warehouses may seem a reasonable place to locate a badly needed third warehouse. Yet there are other factors that may be over-looked by focusing only on the warehouse and on current problems. In this example, the land use planning process may reveal that the original warehouses no longer efficiently serve their purpose, are poorly located for truck traffic, or are at a site that would be better used as expansion area for the nearby community center. And the plan may propose such reuse/ redevelopment in the longer term.



1.10.3. Thus, the role of the plan is also to account for and explain when locations of activities appear to be illogical or inefficient in the short-term, but in reality are moving toward the final land use plan, which will maximize the long-term benefits to the installation.

Section 1D—Land Use Planning as Part of Base Comprehensive Planning

1.11. Land Use Plan Component. The land use plan is a required major component of the comprehensive plan. There will be overlap between the land use plan and other comprehensive plan components because the land use plan draws on and synthesizes many important aspects of these supporting components. For instance, the transportation plan reflects and affects future land use patterns and the functional relationships among various installation activities. Likewise, the facility development plan is essentially a means to implement the physical aspects of the land use plan's goals. The capital improvements program and the five-year defense program are shorter-range vehicles for executing the facility development plan.

Section 1E—Benefits of Planning and Consequences of Not Planning

1.12. Benefits of Planning.

1.12.1. Long-Range Vision. Planning results in a long-range vision of the future within which to frame short-term decisions. The benefits of planning are worth the effort when it is responsive to strategic community and installation goals.

1.12.2. Among the benefits of planning are that it:

1.12.2.1. Gives commanders and facility board members a sound basis for making development decisions.

1.12.2.2. Creates a sense of ownership from different interest groups.

1.12.2.3. Gives the BCE a blueprint for facility siting and programming.

1.12.2.4. Establishes priorities and outlines solutions.

1.12.2.5. Creates an institutional memory.

1.12.2.6. Establishes a framework for responding to changes and opportunities in a coherent fashion.

1.12.2.7. Results in a better living and working environment.

1.12.2.8. Saves resources through goals identification, measurement, and commitment.

1.12.2.9. Better energy efficiency measurement.

1.12.2.10. Rational and compact infrastructure connections by design.

1.12.2.11. Promotes operations and maintenance savings by eliminating or changing inefficient land uses.

1.13. Consequences of Not Planning.

1.13.1. Failure to plan, or completion of only a half-hearted planning exercise, means the installation will not realize these potential benefits.

1.13.2. Consider the negative results of not planning:

1.13.2.1. No one in the chain of command has a coherent, comprehensive view of the installation’s potential.

1.13.2.2. Decisions are made in a "crisis" mode and may be ad hoc or uninformed.

1.13.2.3. The effect of a given decision on the rest of the installation may compound the problem.

1.13.2.4. Inefficiencies in energy use, infrastructure, and facility layout will continue to be cost consuming.

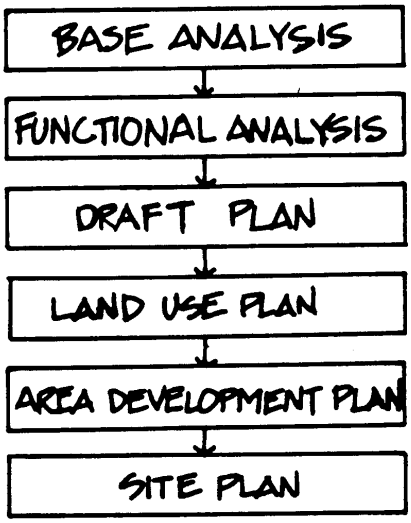
1.13.2.5. Operations and maintenance funds may be invested in keeping obsolete or inappropriately sited facilities operating.

Section 1F—Types of Plans

1.14. Levels of Planning . The cyclical requirement to consolidate and restructure missions, strategic support functions, and readiness is a resource posturing constant that mandates long term land use and base resource flexibility. Mission and installation realignments, closures, privatization concepts, joint service operations, strategic basing options, and mission consolidations are alternatives evaluated and mandated by higher headquarters. When command initiated requirements become local management challenges, the options and procedures adopted to formulate the local commander's implementation plan should address all reasonably viable land-use alternatives.

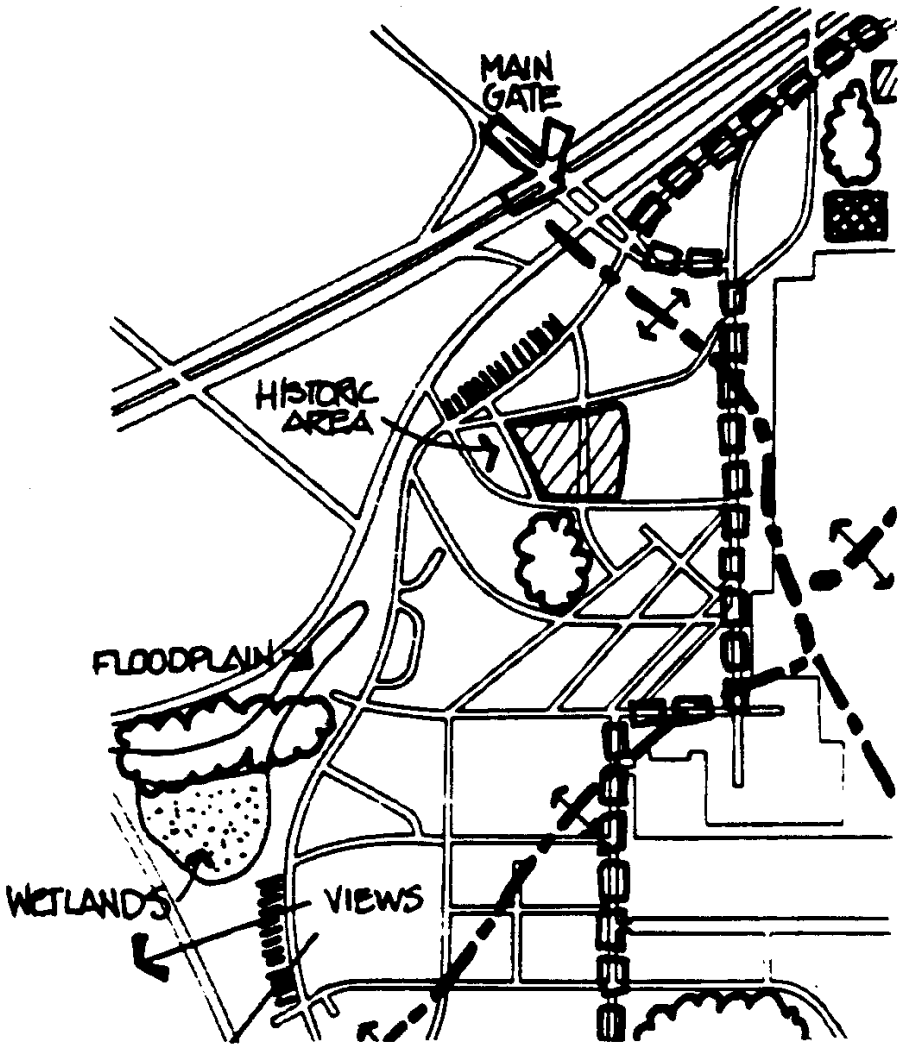
1.14.1. Planning can take place at many physical levels and in varying degrees of detail. **(Figure 1.4.)**. Typical levels of planning are discussed below. Several of these are transitional-levels the base community planner will undertake in conducting the installation's iterative planning process.

Figure 1.4. Levels of Planning.



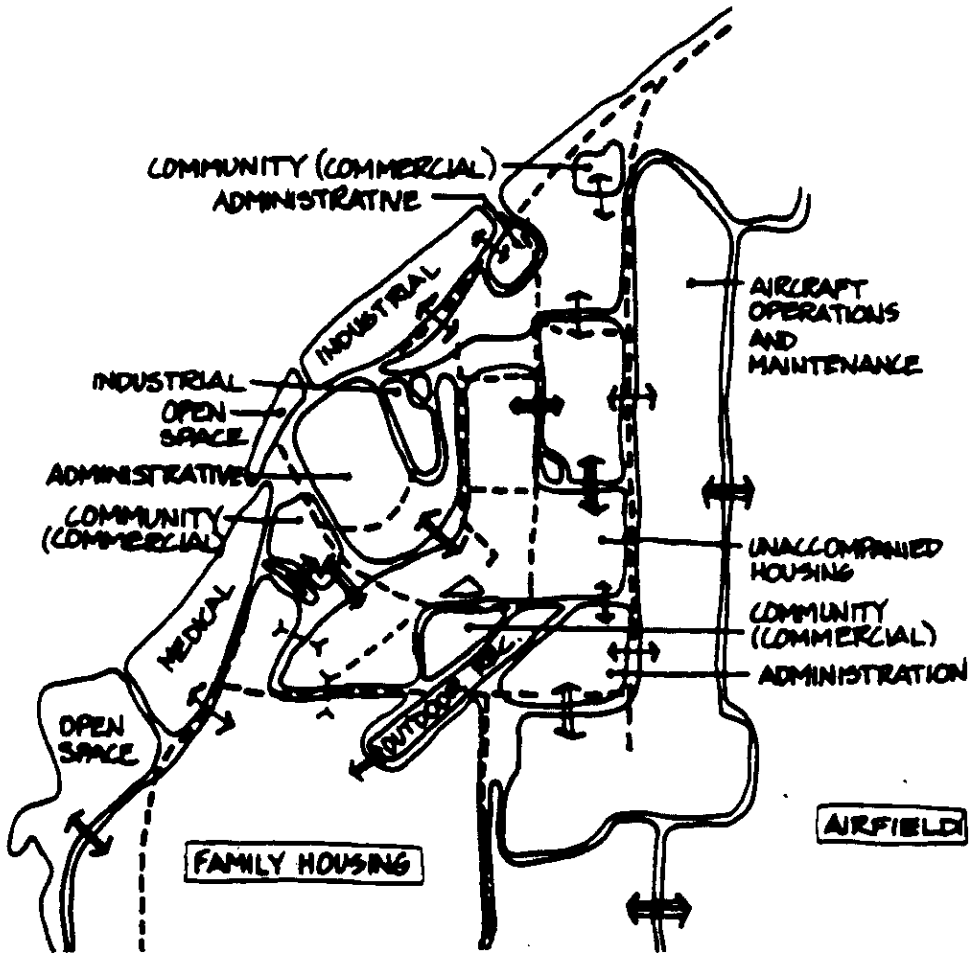
1.14.1.1. Base Analysis. Base analysis is a vital first step in preparing any plan. An inventory of physical, natural, and socioeconomic phenomena on and around the installation results in a composite identification and listing of planning factors **(Figure 1.5.)**. An analysis of this inventory will lead to an understanding of the physical and natural features across the installation and the limitations they may impose on a plan and its subsequent development. It will also yield an understanding of activity on the installation.

Figure 1.5. Base Analysis.



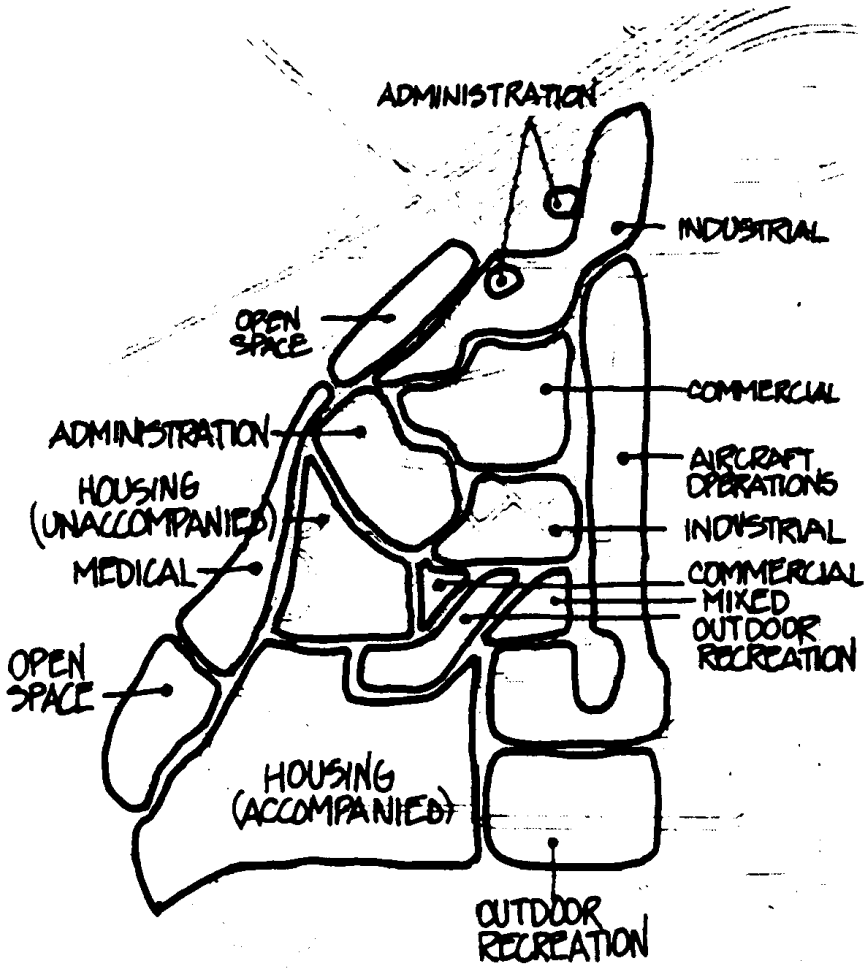
1.14.1.2. Functional Analysis. At each existing installation, activities are already in place and operating. A functional analysis will serve to illustrate--through notes and sketches--the functional relationships among the various activities **(Figure 1.6.**). Once the relationships among activities are defined, it is possible to illustrate them on paper, in the abstract. This modeling of activities promotes understanding of which linkages are close and frequent and which are weak or absent.

Figure 1.6. Functional Analysis.



1.14.1.3. Draft Plan. This level is a preliminary plan—part of the process during which planners "brainstorm" land use alternatives.

Figure 1.7. Draft Plan Alternatives.



1.14.1.3.1. The basis for the draft plan is a merger of the physical realities of the base and future needs, discovered in base analysis, with the functional analysis which shows how activities ought to relate to achieve an effective and efficient execution on the mission.

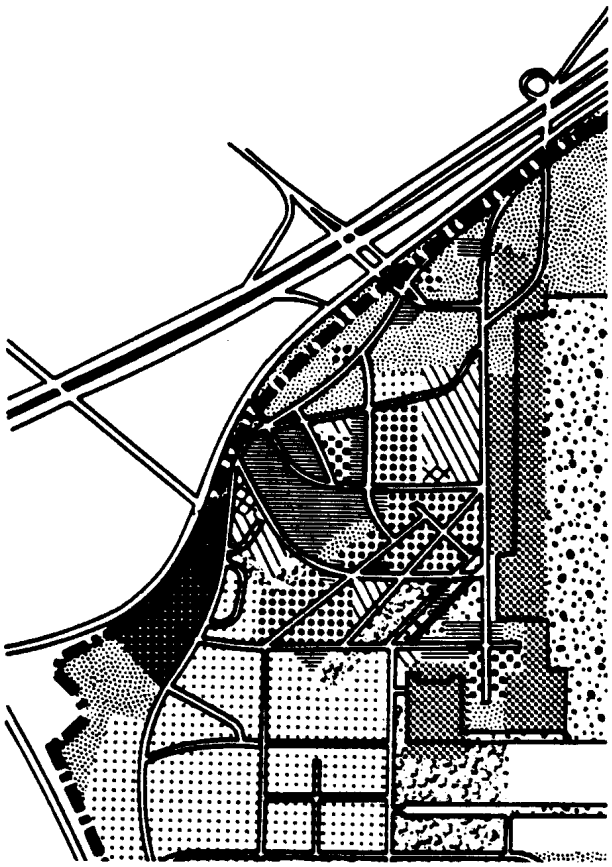
1.14.1.3.2. The draft plan is a working document made by sketching on overlay sheets (usually tracing paper) (**Figure 1.7.**). Working with markers on tracing paper, a group or an individual can brainstorm solutions to problems, "move" buildings and roads into new configurations, and otherwise experiment with various land use arrangements. Each trace sheet can be numbered, dated, and set aside for future reference, or discarded, as the planning group works on other ideas. By posting earlier efforts on the walls, the group can quickly tap the entire range of ideas on how best to integrate function, need, geography, limitations, and other influential factors into a final plan.

1.14.1.3.3. This process results in several alternative arrangements of land uses that maximize resources, improve functional relationships, alleviate specific problems identified in data collection, and achieve specific base goals.

1.14.1.4. The future land use plan (**Figure 1.8.**) is a formal plan in that it is the product of a rational, iterative process, incorporates input from segments of the Air Force community, and has been officially adopted or approved by the installation command structure and approved by the major

command. Once the idea generation and brainstorming of the earlier planning phases are satisfactorily performed, the land use plan is depicted graphically (Map D 1.1) and developed as a written report. The report explains the underlying information and the process used, the goals to be achieved, the reason for various aspects of the plan, and an implementation strategy.

Figure 1.8. Land Use Plan.

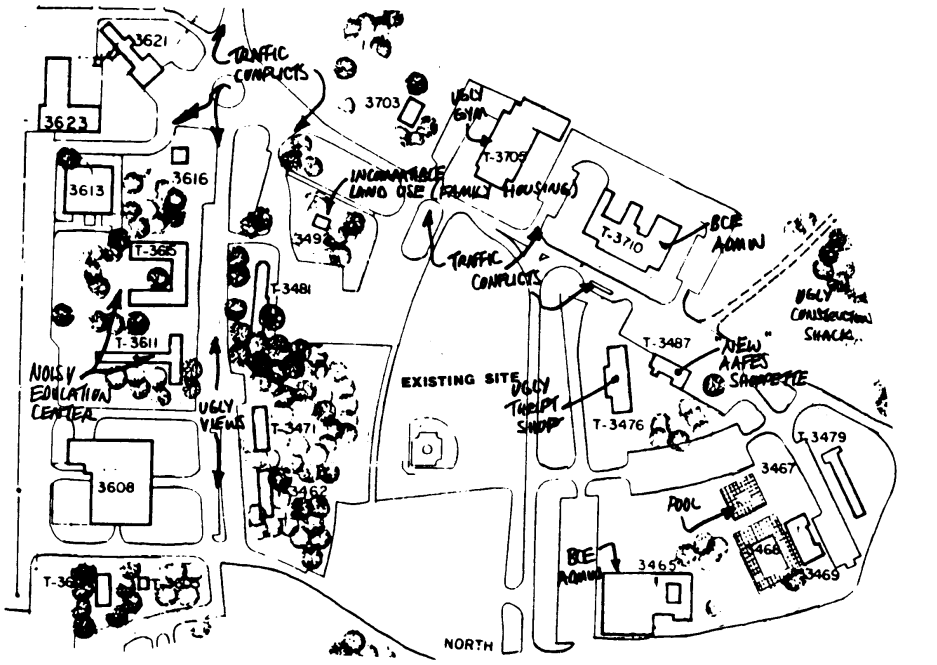


1.14.1.5. Area Development Plan. This is a plan (**Figure 1.9.**) which elaborates on the proposed development of a special area. It illustrates the functional as well as physical and human aspects of areas to be developed. This plan may be short range but could show proposed long-range (10-15 yr.) physical changes. It generally includes roadways, pedestrian paths, parking, utility alignments, etc. Common applications are the community center, flight line, administration complexes, etc.

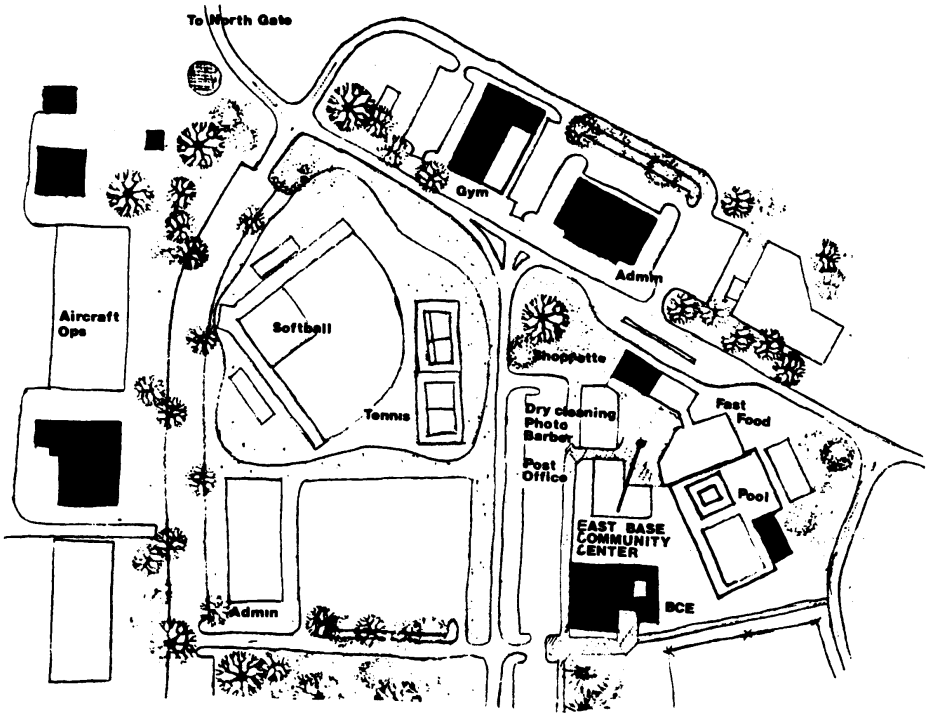
1.14.1.6. Site Plan. A site plan is a detailed plan for a specific project (**Figure 1.7.**). It shows the relevant natural and built features of the site, including precise locations of buildings, parking areas, driveways, landscaping, fencing, walkways, signs, lights, etc. The site plan is a graphic representation of exactly what a site would look like when complete. Site plans are usually a pre-construction design phase.

1.14.1.7. Good planning addresses the specifics of all relevant land-use compatibility interests. Air Force planning should address any contemporary issue that defines the physical limits required to sustain or complement its use of the land.

Figure 1.9. Area Development Plan.

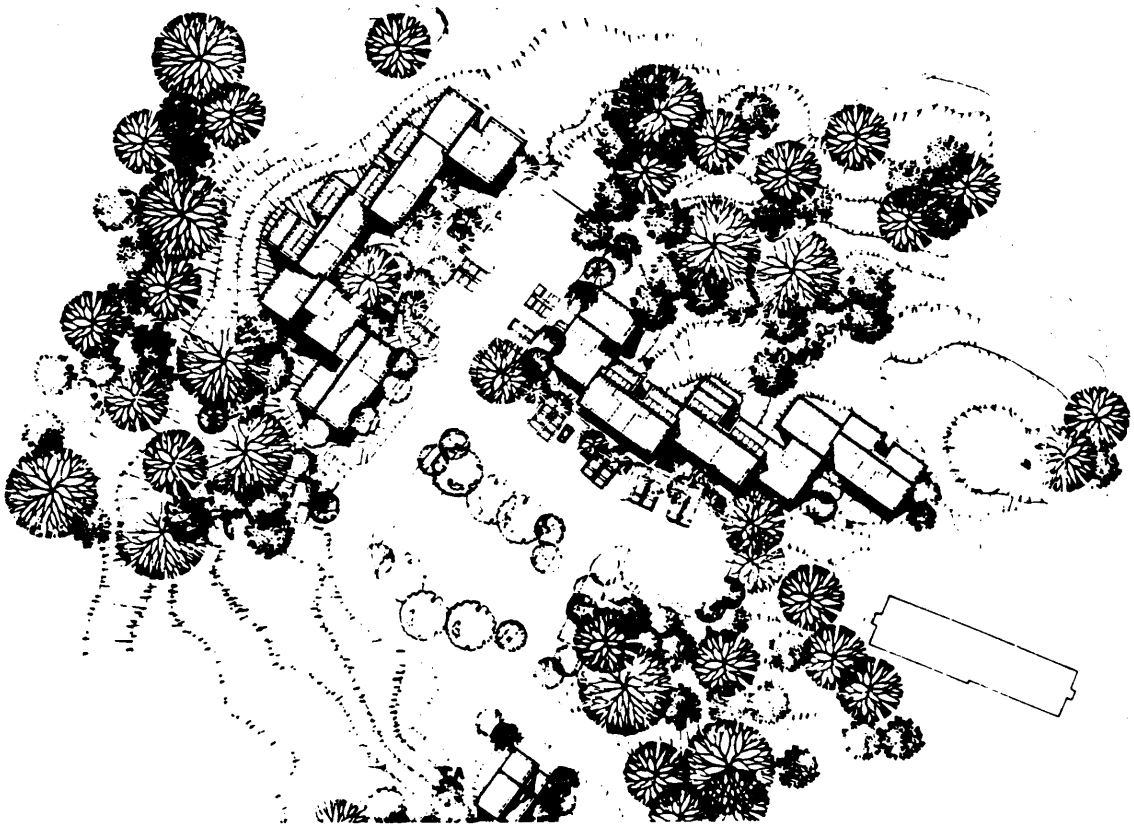


Existing Conditions



Future Conditions

Figure 1.10. Typical Site Plan.



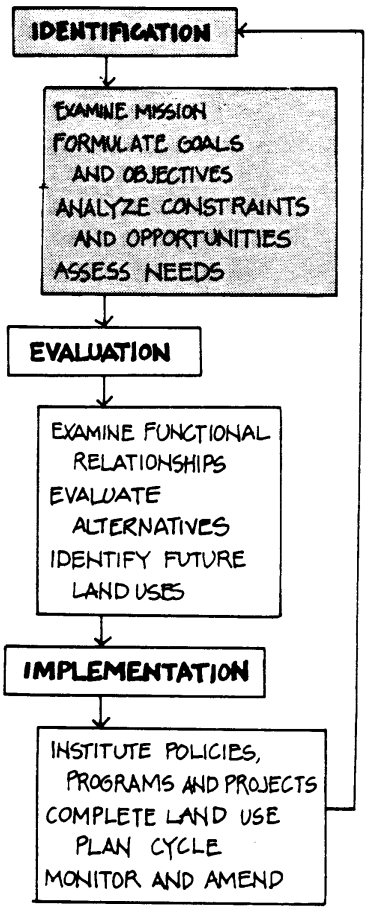
Chapter 2

GOALS, OBJECTIVES, AND POLICIES

Section 2A—Hierarchy of Definitions

2.1. Starting Point.

2.1.1. Developing goals and objectives very early in the identification phase of the planning process is important. The precise meanings of related terms need to be clearly understood. Frequently, terms like "goals and objectives," "policies," and "programs" are used interchangeably without a full understanding of what they are. The following is a definition of terms:



2.1.1.1. GOAL: A desired end-state, not necessarily quantifiable; a valuable target for planning.

2.1.1.2. OBJECTIVE: A more specific component of a goal; usually, but not always quantifiable. Used to measure progress toward a goal.

2.1.1.3. POLICY: A definite statement about the direction that will be taken to achieve the objective, and thus, the goal. A guide for routine actions.

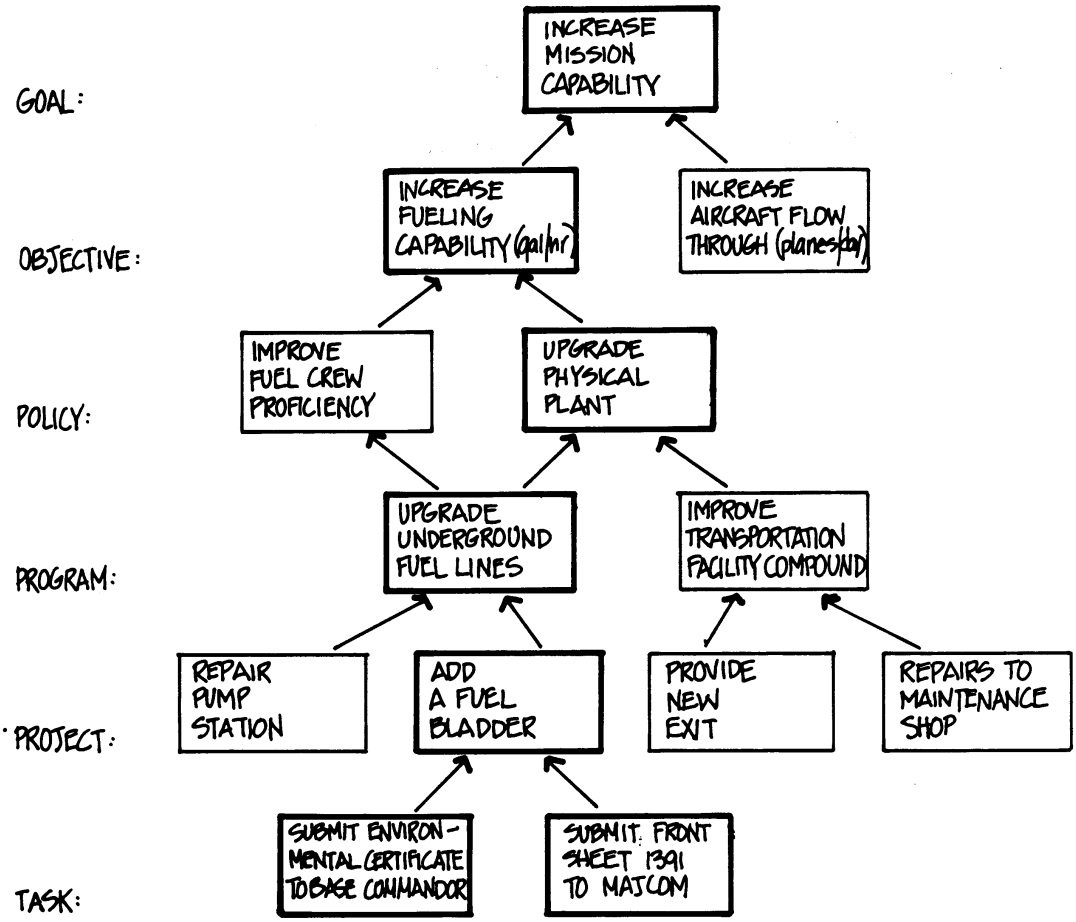
2.1.1.4. PROGRAM: A structure for applying policy to advance toward an objective; usually describes the time and resources required for implementation.

2.1.1.5. PROJECT: A set of individually identifiable, specific tasks that comprise a program.

2.1.1.6. TASK: Smallest work element in the system; a single, focused work effort.

2.1.1.7. MILESTONE: An established point in time to help measure progress by completion of a task, project, or program.

Figure 2.1. Hierarchy of Terms: Goals to Tasks.



2.1.2. The goal is the broadest of terms; each succeeding term is narrower in focus. The hierarchy of terms, from goals to tasks, is illustrated in **Figure 2.1.**

Section 2B—Goals of Base Comprehensive Planning

2.2. Purpose.

2.2.1. The primary purpose of the planning process is to support and enhance the operational mission of the installation. This is accomplished by providing a comprehensive plan that constitutes the framework for programming, design, and construction of facilities, structures, and infrastructure. In the short run, the process links mission planning to developing policies, programs, and specific

projects for on-base facilities and systems. In the long run, the overall development of the installation, including the types and siting of facilities, is guided by the comprehensive plan.

2.2.2. The Air Force has developed goals for the Comprehensive Planning process. These are presented below:

2.2.2.1. Effective, orderly direction of the long-range development of the installation.

2.2.2.2. A comprehensive procedure for relating mission planning to policies, programs, and specific projects for facilities and systems.

2.2.2.3. A framework for integrating coherently the different component plans of the comprehensive plan.

2.2.2.4. A complementary and harmonious relationship between the base and the civilian community brought about and maintained through cooperative information exchange.

2.2.2.5. Wise protection, use, and management of resources from the natural and built environments.

2.2.2.6. The highest possible quality of life for the Air Force community.

Section 2C—Land Use Planning Goals and Objectives

2.3. Plan Development.

2.3.1. The development of the individual installation's land use plan will be guided by developing a well-conceived set of land use planning goals and objectives. The unique mission of each base and characteristics of its built and natural environments require the base to customize its land use goals and objectives.

2.3.2. Presented below is a set of Air Force land use planning goals and objectives. These are based on the comprehensive plan goal of achieving optimal land use relationships both within the base and between the base and the surrounding community. These goals can be used as the framework for each base's effort in developing its own set.

2.3.2.1. Develop the most efficient and effective land use plan.

2.3.2.1.1. Establish planning guidelines that support the current and projected mission of the installation.

2.3.2.1.2. Ensure that functionally related land use categories are located near each other.

2.3.2.1.3. Integrate the variety of environmental, historical, and technical data into a cohesive and practical land use plan.

2.3.2.1.4. Promote energy efficiency through facilities siting and layout of systems (e.g., utilities. transportation).

2.3.2.1.5. Consolidate related functions/activities.

2.3.2.1.6. Protect and manage natural resources in accordance with national policies to benefit the public and enhance the installation's quality of life.

2.3.2.2. Plan for Future Growth and Change.

2.3.2.2.1. Provide for future expansion and construction of new facilities so that functional relationships are not adversely affected.

2.3.2.2.2. In life-cycle economics, allow for maximum adaptability and rapid implementation of changes in land use, facilities, and systems in response to changes in mission.

2.3.2.2.3. Be alert and proactive concerning future growth in adjacent off-base areas that might limit the ability of the base to perform its mission.

2.3.2.3. Compatible, Coordinated Land Use Decisions. Promote compatible and coordinated land use decisions and policies by federal, state, county, and local agencies.

2.3.2.3.1. Monitor on-base and off-base lands use in perimeter areas and promote compatible and complementary development.

2.3.2.3.2. Use Air Installation Compatible Use Zone (AICUZ) guidance in base planning and promote its use in local area development.

2.3.2.4. Visual and Aesthetic Enhancement . Enhance the base's visual and aesthetic resources.

2.3.2.4.1. Make optimal use of desirable natural landscapes, such as scenic views, coastal locations, vegetation stands, rock outcroppings, etc.

2.3.2.4.2. Use visually compatible and complementary architectural designs and building materials.

2.3.2.4.3. Develop siting and landscaping guidelines that ensure access to sunlight and preserve sightlines for individual structures.

2.3.2.5. Quality of Life. Consider the well being and quality of life of installation personnel and military families in making land use decisions.

2.3.2.5.1. Provide natural areas for enjoyment and education.

2.3.2.5.2. Provide outdoor recreation for physical and mental well-being,

2.3.2.5.3. Provide for the separation of major transportation linkages from predominantly pedestrians activities.

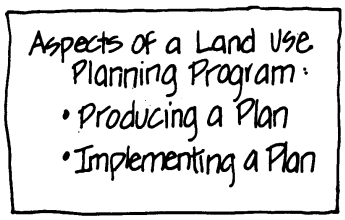
Chapter 3

PLANNING TO PLAN

Section 3A—Program Development

3.1. Elements of the Program.

3.1.1. Land use planning results in a product (i.e., the land use plan), and consists of a process that implements the plan. Thus, it is imperative that base planners devote considerable effort early in the Identification phase to develop a planning program that can accommodate both the product and process aspects of land use planning. The objectives of this program are to produce a coherent and implementable plan.



3.1.2. A land use planning program is made up of the following elements:

3.1.2.1. Documentation recording the plan and its implementation strategy.

3.1.2.2. People and resources committed to the program.

3.1.2.3. A system for collecting, validating, maintaining, and making use of information.

3.1.2.4. A means of involving the base community and promoting the plan and planning concepts throughout the installation.

3.1.3. The BCE planner should have a subprogram for each aspect of the overall planning program. In developing a written program, the planner needs to answer these and other questions:

3.1.3.1. Documentation.

3.1.3.1.1. Who is responsible for all aspects of the plan?

3.1.3.1.2. How will the process be recorded, and how will the written and graphic results be used?

3.1.3.1.3. How will compliance with AFI 32-7062 be ensured and how will the plan be integrated into the comprehensive plan?

3.1.3.2. People and Resources.

3.1.3.2.1. Who is committed to the program: how long, what percentage of time?

3.1.3.2.2. What skills are needed? Available?

3.1.3.2.3. What resources need to be committed?

3.1.3.3. Information collection.

3.1.3.3.1. What is needed? What is available and what needs to be collected?

3.1.3.3.2. Who will be in charge of all data, where will it be compiled, and who will synthesize it?

3.1.3.3.3. What data need to be regularly updated?

3.1.3.4. Involvement.

3.1.3.4.1. How can the base command structure and the base community contribute ideas to the process?

3.1.3.4.2. How will they be kept informed?

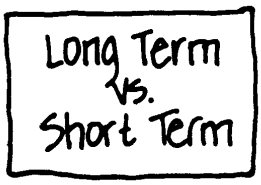
3.1.3.4.3. What feedback mechanisms need to be established for both the planning stages and the long-term implementation?

3.1.4. To make the program work, these four elements have to be thought through and a plan devised for each. In the same way that a strategy is needed to implement a finished plan, a strategy needs to be developed to create the plan, foster its success, and create a means of keeping it current.

Section 3B—Long-Range Strategies

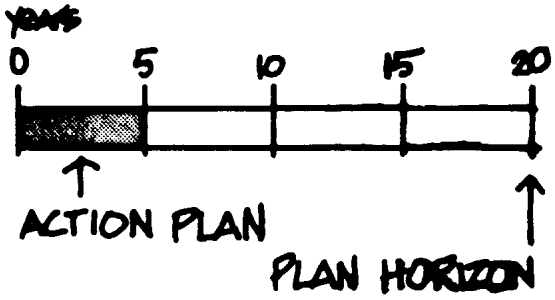
3.2. Program Management.

3.2.1. The management of the planning program is a dynamic task. One aspect of this is the pace of daily needs versus the need for a longer-term strategy and a means of making daily decisions that work toward long-term goals. For example, there is the desire to make good use of perfectly serviceable buildings and the desire to build new facilities that are a better fit for the mission. Part of a long-range strategy could be to foster creative use and reuse of structures, but also to recognize when structures are truly obsolete and a drain on resources in the long run.



3.2.2. Ultimate Base Development . The period of time for which the planner is prepared to plan will vary, depending on the particular aspect of a plan that is under scrutiny. Typically, a 20-year horizon is established for a plan, with a 5-year action plan to get the plan's implementation on track (**Figure 3.1.**). But in fact, some elements of' a plan will have a different time frame. For instance, if there is a need for better directional signs throughout the base--with uniform design and consolidation--this aspect of a plan can be implemented in a very short time. Conversely, landscaping is a long-term program that must take into account the life span of vegetation, particularly trees. Some trees will become stately elements of the base's open space only after 40 to 60 years of growth. Fast-growing species will not grow to the same stature but will fill out an area more quickly. They will also die and need to be replaced sooner.

Figure 3.1. Plan Periods.



3.2.3. By having a long-range strategy for each element of the plan, the planner avoids being drawn into the need for a "quick fix" or an immediate payoff. A better sign system is the contribution to the base next year; a mature, aesthetic landscape is a legacy to be fully enjoyed by future generations of Air Force personnel at the base.

3.2.4. Critical time constraints are often imposed on the plan's implementation period by the project approval and funding process, as well as the design and construction process. A realistic plan schedule can only be developed if the planners are familiar with the delays and uncertainties inherent in these processes. The BCE programming (contract planning), engineering, and technical design sections are the normal information sources in these areas.

3.3. Program Schedule.

3.3.1. By tying the land use plan to the transportation plan and the facilities development plan, the planner can devise a coordinated schedule for all goals. Then, working with the available funding programs (MCP, O&M, NAF, etc.), he or she can plot a strategy to achieve each intermediate goal. By having a documented strategy, base personnel responsible for planning and plan execution can take advantage of sudden funding opportunities as well as know in advance how programmed funds will be spent in the years ahead.

3.3.2. Reviewing the strategy periodically is a good practice, as changes in mission, the arrival of new tenants, or new directions from headquarters may create a need to revise the strategy and schedule.

3.3.3. A further benefit of the carefully documented long-term strategy is that it lets subsequent decision-makers know about base commitments. When a change is needed, the strategy quickly shows commitments, which can be delayed or revised.

Section 3C—Analysis of Planning Factors

3.4. Characteristics.

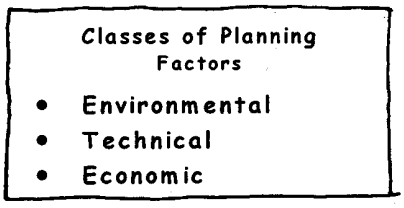
3.4.1. Each installation will have characteristics that either constrain development or present unique opportunities. Planners must identify and understand the extent of these constraints and opportunities before beginning to develop the land use plan. For example, environmental factors such as steep slopes, flood plains, hazardous waste sites, etc., may limit development potential. Conversely, a base located along the seacoast would present an excellent opportunity for developing housing that offers access to the water-based activities and a scenic view.

3.4.2. The analysis of constraints and opportunities has two primary purposes in the land use planning process. First, land use plans should be developed with a full awareness of the applicable constraints and opportunities. It is a waste of effort to propose development in an area that is clearly infeasible due to constraints that cannot be avoided or mitigated.

3.4.3. Second, the constraints and opportunities are used in evaluating the land use plan. It is evaluated on the basis of how well it conforms to the constraints, and to what extent it takes advantage of the opportunities.

3.5. Classes of Planning Factors.

3.5.1. There are generally three classes of planning factors: environmental, technical, and economic. These factors can take the form of either constraints or opportunities, depending on the specific situation.



3.5.2. The first two classes are similar in that they are mapable (**Figure 3.3.**). They can be used to graphically indicate the conditions of certain areas of a base for development. Environmental and technical factors can limit the suitability of a particular facility or structure at a specific location. The third class is generally not mapable and does not operate in a spatial context.

3.6. Map Environmental Factors.

3.6.1. The first step in dealing with planning factors is to examine and map the environmental factors. These are defined as features of the natural environment that affect the development of areas because either (1) they should be preserved, or (2) they must be taken into consideration in determining the potential environmental impacts of development. It should be noted that some features of the natural environment, such as soils, directly affect the economic and engineering feasibility of developing a site. These are referred to as "technical constraints" and will be discussed later.

3.6.2. One technique to display planning factors is the overlay/composite method. The environmental factors are displayed on map overlays showing areas limited to or precluded from further consideration for certain types of development. These maps must be produced at the same scale as the installations base map (Map C-1). Dimensionally stable film should be used for each overlay layer.

3.6.3. Each overlay is then placed on the installation’s base map. The composite environmental limitation of development is the sum of all the areas indicated by each overlay (**Figure 3.2.**).

Figure 3.2. Planning Factors Map.

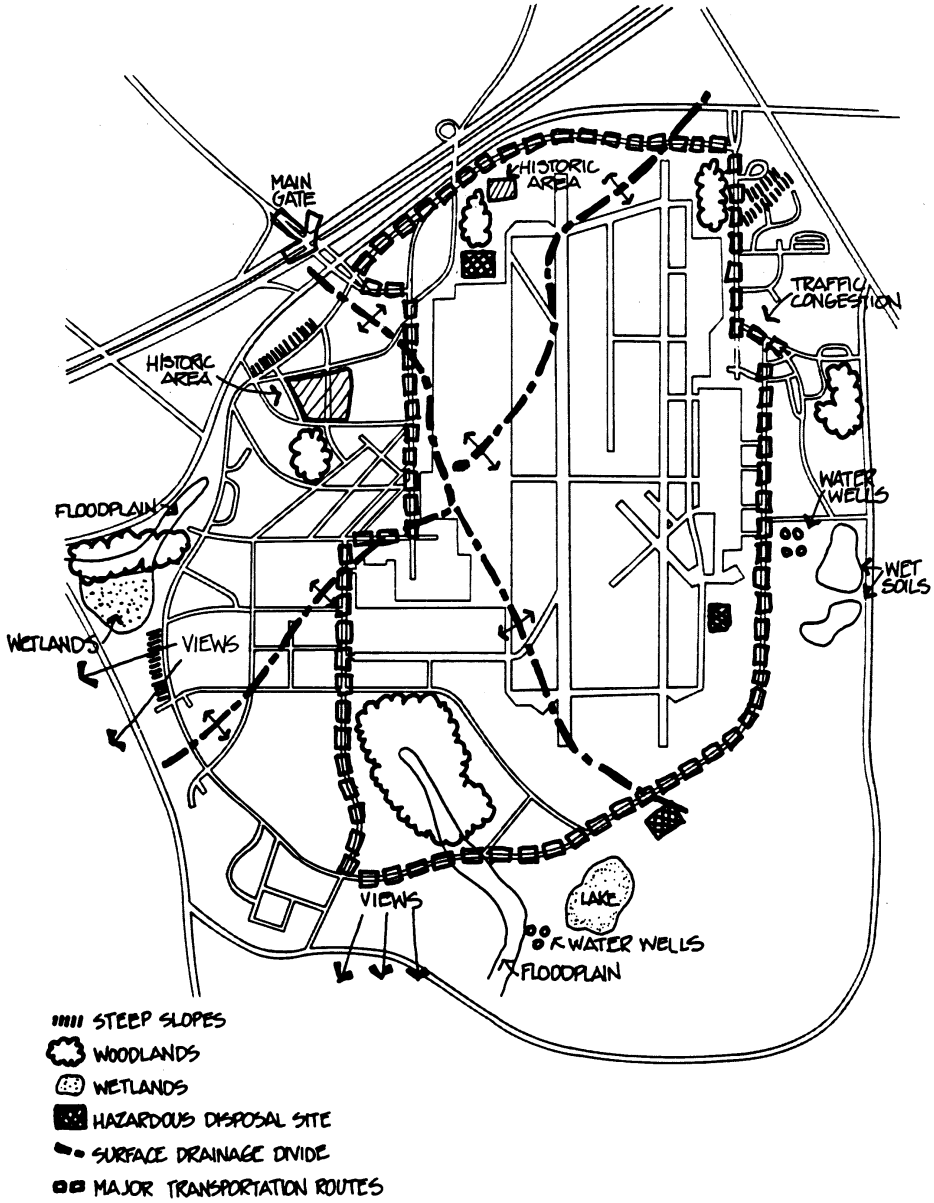
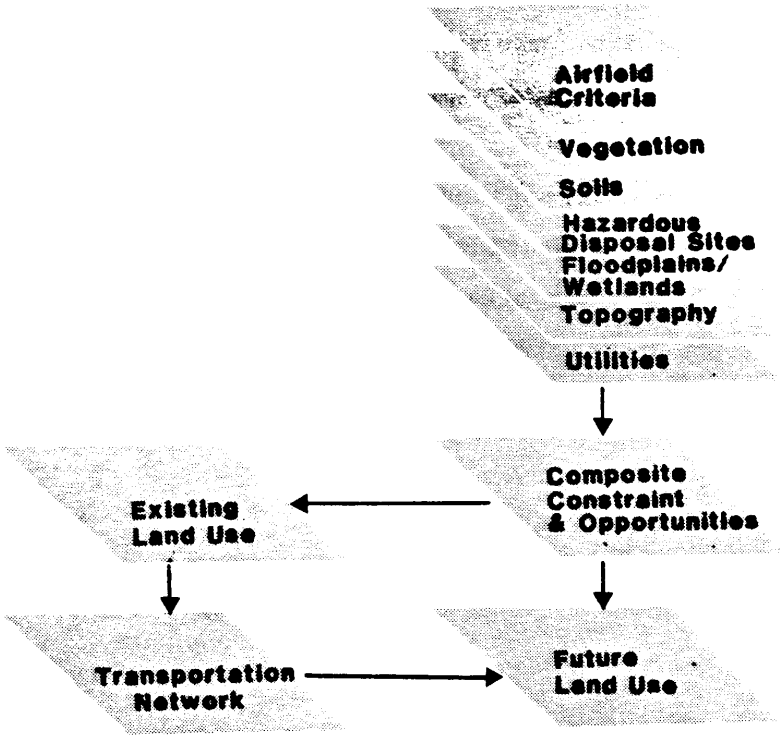


Figure 3.3. Overlay System.



3.6.4. There are a wide variety of potential environmental factors. They vary in terms of the limitations they place on different types of land uses. For example, an area lying within a floodplain is clearly limited in terms of its suitability as a location for industrial, housing, administrative, community commercial, etc., uses. However, floodplains are suitable for use as open space or as locations for outdoor recreation facilities.

3.6.5. In preparing the overlays, planners should attempt to place information by major environmental category (i.e., topography, soils, hydrology, etc.) on one map where possible.

3.7. Map Technical Factors.

3.7.1. The second step of the analysis is to map the technical factors. These are defined as characteristics of the built and natural environments that affect the technical; feasibility and cost of developing a particular location on an installation. These factors relate primarily to the ability to apply engineering solutions to developing a site. In some cases, engineering solutions may not be technically feasible, while in others, they may be so expensive as to effectively preclude development.

3.7.2. The BCE engineering and technical design section, and operations and maintenance branch. and the base communications (information systems) organization are the usual sources of information for technical constraints involving utility and transportation systems, facility requirements and site conditions. Although certain data may be available on some maps (G series), careful review and coordination among these agencies is necessary to verify the accuracy of the information and to identify the potential problems and opportunities resulting from existing conditions.

3.7.3. Other technical constraints involve the availability of land and facilities. The BCE real property section normally maintains information on easements and leases, as well as basic information on existing buildings (occupancy, age, type construction, size).

3.8. Identify Economic Factors.

3.8.1. Finally, planners must analyze the economic constraints and uncertainties. Some of the economic constraints are directly measurable. Others, such as the installation's contribution to the surrounding region's economy, require a more qualitative analysis.

3.8.2. Planners must also be aware that project cost, time needed for approval, and implementation (construction) are interrelated due to the uncertain nature of the funding and approval process and the design and construction process. A basic understanding of these processes is necessary if the planners are to adequately analyze the effects and implications of economic constraints. The BCE programming (contract planning) and engineering and technical design sections are normal sources for this information.

3.8.3. Tables 3.1, 3.2, and 3.3 list planning factors to be considered and possible information sources. Planners should review the tables to determine the factors applicable to their particular situation, and to see if additional factors need to be mapped for their base.

Table 3.1. Environmental Planning Factors.

Factors	Information Source
Hydrology Existence of an aquifer recharge area Proximity to drinking water supply wells Surface water quality (i.e., present high quality surface water bodies) Depth to groundwater Floodplains Drainage channels and direction of flow	Installation Restoration Program (IRP) Phase I Report
Noise Areas with high noise levels.	AICUZ Report
Topography Steep slopes (15% or greater)	U S Geological Services
Air Quality Maintenance of existing ambient air quality. Emissions limits imposed on new sources	Local Planning Agency
Ecology Known locations of rare or endangered species Wildlife habitat Concentrations of valuable or unique vegetation Forested areas	U.S. Fish and Wildlife Service
Geology Faults Seismic activity Depth to bedrock	IRP Report
Aesthetic Resources Scenic natural features, such as rock outcroppings, creeks or ponds, trees, buffer areas, etc Scenic views that result from hills and sloping terrain	Visual Observation
Soils Productive soils (especially prime or unique farmlands) Load bearing capacity Foundation suitability (i.e., septic system suitability)	U.S. Soil Conservation Service
Disturbed Lands Borrow pits Old foundations Landfills	IRP Report

Table 3.2. Technical Planning Factors.

Factors	Information Sources
Utilities Availability of, or proximity to, water, sewer, gas, electric, and communication lines	G-Series
Capacity of utility systems (includes capacity of distribution and trunk lines and available supply—i.e., including treatment capacity)	Civil Engineering Operations and Maintenance
Land Presence of undeveloped land Existing easements, leases Landmarks and Monuments	Map C-1 Civil Engineering Real Property Federal Aviation Administration (FAA) Public 405, Standards for Aeronautical Surveys
Transportation Capacity of primary and secondary routes leading to site Flow conditions on nearby roads Road segments operating over capacity during peak commuting periods	Military Traffic Management Command Report
Safety Airfield in clear zones or accidental potential zones	AICUZ Report
Presence of hazardous materials, including radioactive materials	IRP Report
Airfield Clearances and Airspace Surfaces	AFJMAN 32-1-1013, Vol. 1
Explosives quantity-distance safety clear zones	AFMAN 91-201
Radio Frequency (RF) hazards	Bioenvironmental Engineer
Fire security police, and medical service capacity to accommodate new development	Each Agency
Physical Security Antiterrorist measures Lines of sight Secure Areas	Security Police AFI 32-101 V1, The Air Force Physical Security Program AFI 32-209, The Air Force Resource Protection Program USAF Installation Force Protection Guide

Table 3.3. Economic Planning Factors.

Factors	Information Sources
Project Costs What is the life cycle cost (i.e., leveled annual unit costs)?	Civil Engineering Contract Programming
Local and Regional Economic Impacts Will there be a decrease in employment of the areas residence? Will the regional economy be affected?	Local Planning Agency
Budget	Civil Engineering
Are time constraints imposed for the expenditure of funds (i.e., must they be spent within a given period)?	Contract Programming
Are there any time delays in budget approval process?	
Investments in Infrastructure Will significant additional funds be required to supply infrastructure (e.g., utilities streets, etc.)?	Civil Engineering Operations and Maintenance

3.9. Realistic Planning.

3.9.1. A plan, which fails to adequately consider the implications of technical and/or budgetary constraints, uncertainties, and critical short-term effects, will likely be ignored or will be a source of continual controversy.

3.9.2. Consider carefully recommendations, which involve the following similar actions:

3.9.2.1. Relocation of several related facilities at different times. Can the affected agency operate effectively during the interim periods when the facilities are separated, particularly if necessary funding is delayed?

3.9.2.2. Area selections which appear attractive functionally, but which will require extensive site infrastructure development. If an individual project (for locating a facility in the area) must absorb the cost of the improvements, it may face additional delays and increased uncertainty during the approval and funding process. Also consider the effects on future projects if a utility or transportation development project is delayed or canceled.

3.9.2.3. A good plan is a balance of long-range vision and careful reconsideration of short-term effects and realities. Base organizations and tenant units must be able to perform their mission effectively during "interim" periods on the way to achieving future land use goals.

Section 3D—Needs Assessment

3.10. The Base Physical Plant.

3.10.1. Capacity Of Physical Plant. One determinant which significantly influences the future land use plan is the ability of the base's current physical plant (e.g., buildings, equipment, infrastructure, and systems) to adequately house and support its various activities and functions. At any point in time, a base is always in the process of upgrading its physical plant by a variety of means. These include:

3.10.1.1. Rehabilitating and renovating old buildings and utility systems.

3.10.1.2. Demolishing substandard and dilapidated structures.

3.10.1.3. Constructing new buildings.

3.10.1.4. Expanding undersized facilities.

3.10.1.5. Consolidating related functions and activities that are presently scattered.

3.10.2. A crucial action in the land use planning process is determining the need for future capital improvements, particularly of buildings and infrastructure that will have a significant influence on the base's land use pattern. These requirements must be developed from an accurate assessment of the current problems and deficiencies in the installation's physical plant.

3.10.3. A needs assessment should follow the planning factors analysis. For example, a constraint on the future development of family housing due to a shortage of sewage treatment capacity can be easily translated into an assessment of how much additional capacity may be required, and where the new trunk lines should be located.

3.10.4. A needs assessment should be performed by examining each of the functional land use areas in detail with regard to the following issues:

3.10.4.1. Are there buildings or structures whose condition is so deteriorated and overly expensive to maintain that they should be demolished?

3.10.4.2. Are there buildings that are clearly inadequate and substandard for the activities and functions they house, due to deficiencies in size, design, layout, etc.?

3.10.4.3. Are there examples of dispersed but functionally related activities whose collective efficiency could be improved through consolidation in a single structure?

3.10.4.4. Are there buildings clearly in the wrong location (i.e., incompatible with their surroundings, too inaccessible to pedestrians, ill-served by the on-base transportation system, etc.)?

3.10.4.5. Are there buildings that are clearly underutilized and present opportunities for improved efficiency of use through renovation, rehabilitation, etc.?

3.10.5. Record strategies. Throughout the analysis of planning factors and the preparation of the needs assessment, specific strategies will become apparent for overcoming constraints, meeting identified needs, etc. Planners should record these for later consideration in developing detailed policies, programs, or projects for implementing the land use plan. **Chapter 7** discusses the development of base policies, programs, and projects.

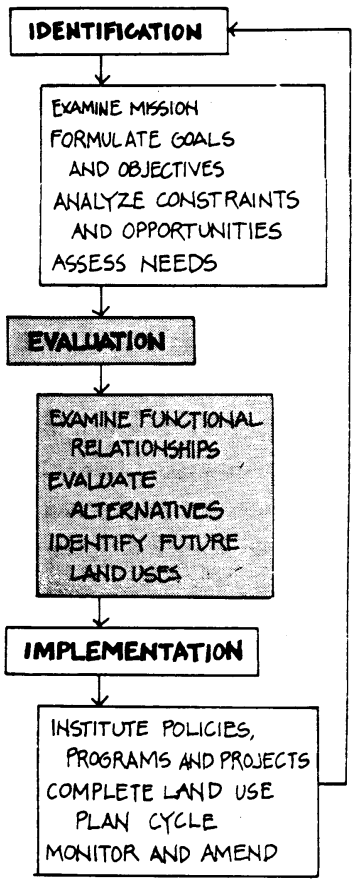
Chapter 4

FUNCTIONAL RELATIONSHIPS ANALYSIS

Section 4A—Defining Functional Relationships

4.1. Dependent Land Uses.

4.1.1. The Evaluation phase of the planning process begins with an examination of the functional relationships among existing land uses. A functional relationship exists between land uses when there are dependencies between the activities that occur within each use. Dependencies are evident by the flows (e.g., raw materials, information, people, energy, support services, administrative services, finished goods, etc.) between these land uses. A functional dependency exists when the efficient performance of activities within one land use class depends upon maintaining or enhancing the flows that originate in another use.



4.1.2. Criteria that affect functional relationships include:

4.1.2.1. Ability to efficiently and effectively accomplish the installation mission.

4.1.2.2. Flexibility to respond and adapt to changing conditions.

4.1.2.3. Security of sensitive functions and the ability to control access and respond to emergency situations.

4.1.2.4. Maintenance of necessary communication linkages.

4.1.3. Maintain Flow. The ease of maintaining flows between dependent land uses, and increasing the efficiency of the activities that comprise each use, is most easily achieved by locating them next to each other. There are a number of benefits to be gained through the spatial adjacency of dependent uses:

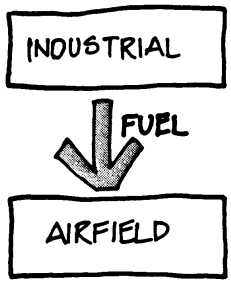
4.1.3.1. Increased efficiency and productivity in performing activities.

4.1.3.2. Shorter distances between activities to accommodate movement of materials or people.

4.1.3.3. Increased opportunity for more face-to-face interaction.

4.1.4. Flows between land uses may be in one or two directions. A one-directional flow, such as fuel from an industrial area storage tank to the airfield, implies a one-way dependency in which only one of the land uses, the airfield, is the primary beneficiary of the proximity of the two uses (**Figure 4.1.**). The efficiency of airfield activities directly depends upon proximity to fuel. In a sense, the location of the airfield determines where the industrial activities will be located.

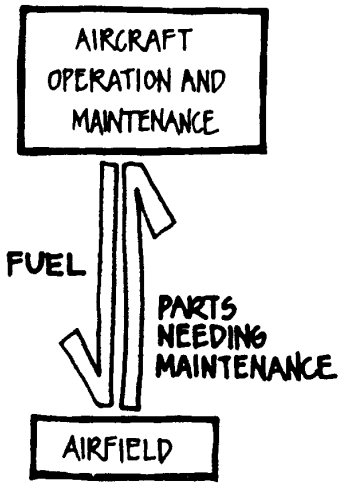
Figure 4.1. One Way Dependency.



4.1.5. A flow in both directions implies that efficiency of activities in both land uses benefits by being in proximity with each other. (**Figure 4.2.**). As an example, unaccompanied personnel benefit by living close to the community center, as they are dependent upon the facilities found there (e.g., BX, restaurant, laundry, etc.), and because they are less likely than other personnel to have access to automobiles. Similarly, the community center becomes a more fully used and meaningful focus of social interaction when it is easily accessible to unaccompanied personnel.

4.1.6. Land uses may also be linked through organizational relationships and compatibility or incompatibility of their component activities. Links may occur when there is no dependent relationship between adjacent land uses, but the external effects of one use (e.g., noise, smoke, vibrations, etc.) adversely affect the other. A reverse situation can also occur in which the quality of the environment of one use is enhanced by being located near another. A common example of the latter is taking full advantage of scenic views and open space in locating and preparing site plans for military housing.

Figure 4.2. Two-Way Dependency.



4.2. Dispersal. In certain cases, facilities within land use categories may be incompatible. For example, the weapons storage area (WSA) and the petroleum, oil and lubricant (POL) storage area are both in the industrial land use category. These facilities must be separated due to the safety hazards associated with both, and because the destruction of one facility could destroy the other (collateral damage). This is also true of essential facilities within the aircraft operations and maintenance category, which may require dispersal to enhance their survivability in a combat environment.

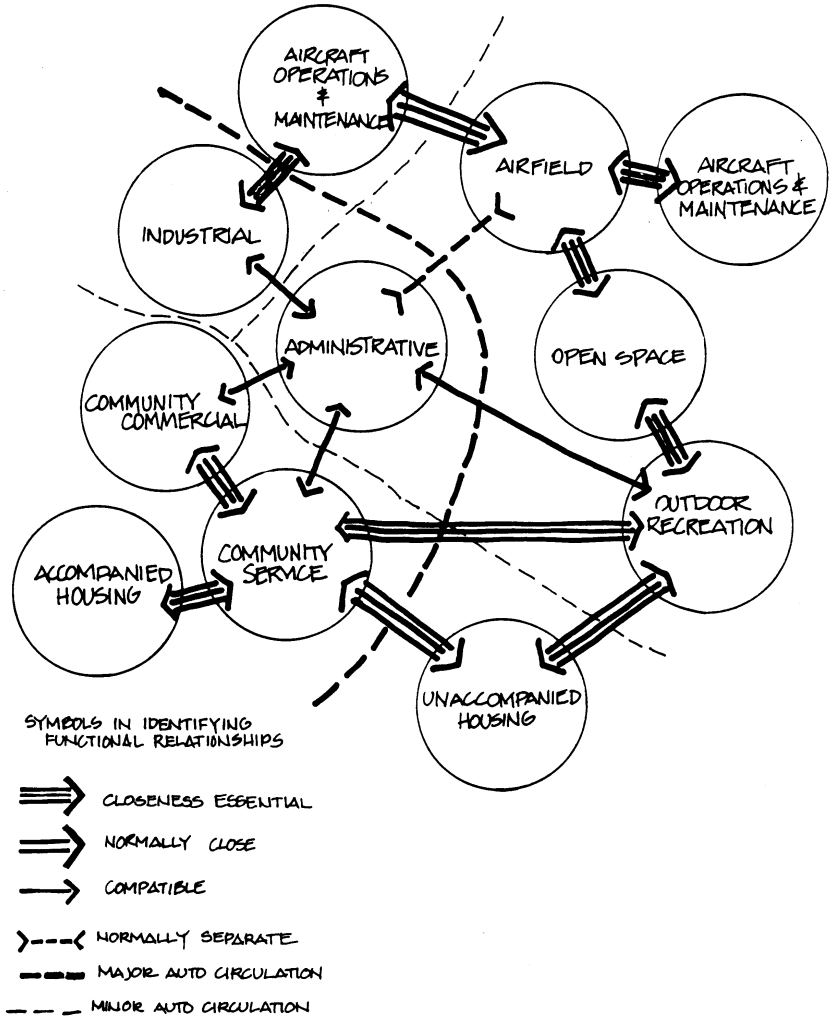
Section 4B—Identifying Functional Relationships

4.3. Purpose.

4.3.1. The purpose of preparing a functional relationships analysis is to determine the degree of connectivity between land uses based on the related activities. **Figure 4.3.** provides an example. This type of analysis portrays the dynamic nature of land use. Functional relationships analysis recognizes that land use is more than simply the location of facilities.

4.3.2. Identifying functional relationships requires coordination among members of a broad range of base activities and organizations. This involvement is necessary to fully understand the nature of flows between areas from the perspective of the users. Participation by the Air Force community in this analysis will also enable planners to better understand the activities performed at different points around the base and the relationships among them. Functional relationships can change with time, resources, and mission requirements. Consider our historic use of our Air Force resources in this relational context. What was considered related yesterday, is not necessarily what is related today. This approach should indicate that the future requirements of the Air Force may not necessitate the same functional relationships we consider useful today.

Figure 4.3. Example of a Functional Relationships Analysis.



4.4. Plan D-7. Preparation of the functional relationship map (Map D-7) will enable planners to better understand and graphically represent the base's land use pattern. This understanding is essential for decision-makers to have before they begin to think about siting new facilities or consolidating activities within one building. The analysis should consider the future needs of the Air Force, the relationships between on-base land uses, and the anticipated relationship between the base and its local environs.

Section 4C—Classifying Land Uses

4.5. Twelve Land Use Categories

4.5.1. The following 12 categories comprise the basic land use types found on an Air Force installation:

4.5.1.1. Airfield

4.5.1.2. Aircraft Operations and Maintenance

4.5.1.3. Industrial

4.5.1.4. Administrative

4.5.1.5. Community (Commercial)

4.5.1.6. Community (Service)

4.5.1.7. Medical

4.5.1.8. Housing (Accompanied)

4.5.1.9. Housing (Unaccompanied)

4.5.1.10. Outdoor Recreation

4.5.1.11. Open Space

4.5.1.12. Water

4.5.2. The above categories are primarily functional in nature and encompass activities that have a common general purpose. For example, all of the facilities, equipment, and structures found under the Aircraft Operations and Maintenance classification are used to perform or support the flying mission. Each land use can be evaluated according to the following criteria:

4.5.2.1. What other types of land uses (and their significant activities) are essential to the efficient functioning of activities or facilities associated with this land use?

4.5.2.2. What is the nature of the interactions between the different land uses?

4.5.2.3. Are operational efficiencies gained by locating certain land uses close to others?

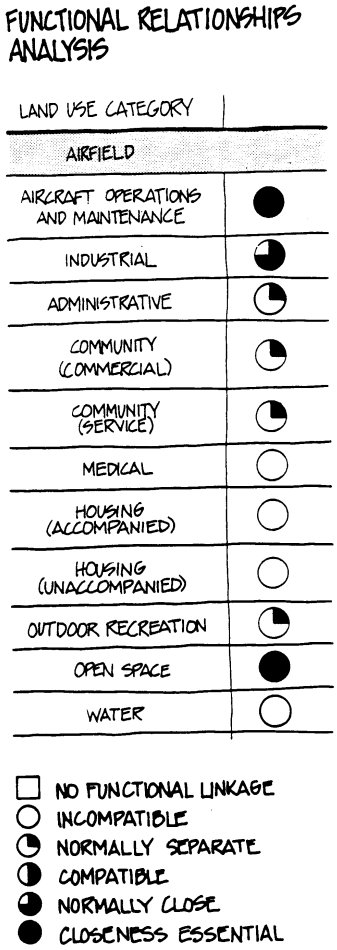
4.5.2.4. What are the type(s) of flow(s) between land uses (e.g., people, information, materials and supplies, etc.)?

4.5.2.5. What are the characteristics of the flows (e.g., size, frequency, timing)?

4.5.2.6. Are there any external emissions or effects associated with a land use that would adversely affect another adjacent use?

4.5.3. Figures 4.4 through 4.12 describe functional relationships among the 12 major Air Force land uses. Figure 4.16 summarizes these relationships. The degree of closeness between and among land uses depends upon operational necessity, convenience, or compatibility.

Figure 4.4. Airfield Functional Relationships.

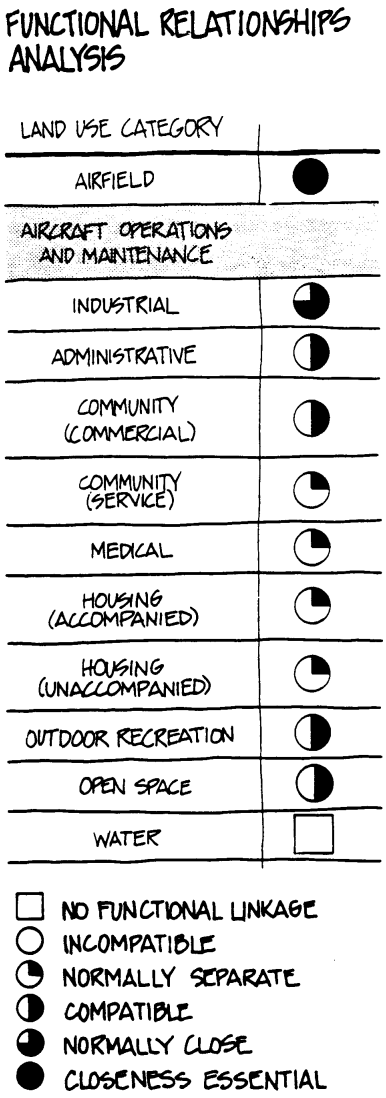


At most Air Force installations, the airfield is not only the dominant land use, or 25-40% of total base area, but is usually the very reason for the existence of the installation. The airfield land use consists of the entire airfield pavement system (runway, taxiway, apron), related open space, navigational aids, and all imaginary airfield and airspace clearance surfaces. The size and configuration of an airfield largely depend on topography, climate, meteorological factors, land availability, and weapons system characteristics

Functional Relationships: The airfield and the aircraft operations and maintenance facilities have a close relationship. It's essential for these land uses to be adjacent to each other to operate efficiently.

Another critical functional land use relationship involves the airfield and open space. To maintain the clear zones, and imaginary airspace surfaces, certain areas of land beyond the paved sections of the airfield must remain free of obstructions.

Figure 4.5. Aircraft Operations and Maintenance Functional Relationships.



The Aircraft Operations and Maintenance category comprises all facilities that directly support the flying mission. It is generally comprised of aircraft support facilities such as hangars, shops, and terminals.

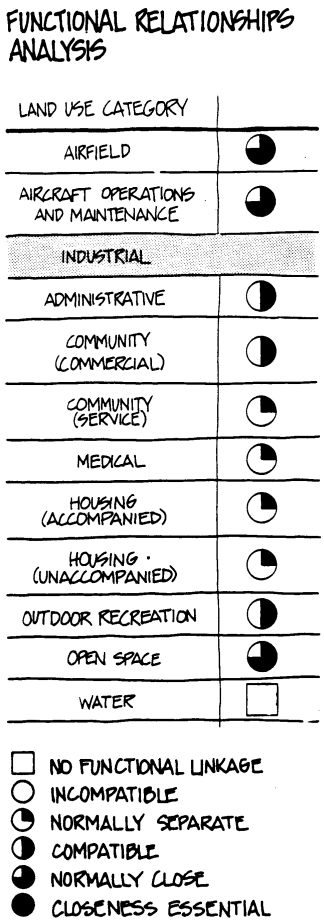
Functional Relationships. As noted in the preceding section on the airfield, aircraft operations and maintenance and the airfield are interdependent land uses.

The airfield is the only activity for which proximity to aircraft operations and maintenance is essential. It is important that the industrial land uses be near aircraft operations and maintenance for ease of cargo transfer.

Certain activities in other land use categories lend themselves to close proximity to Aircraft Operations and Maintenance. These could include BX annex, recreational areas, snack bars, and administrative functions, and related aircraft functions.

There is no need for aircraft operations and maintenance to be close to family or unaccompanied housing, medical areas, or community service land uses.

Figure 4.6. Industrial Functional Relationships.

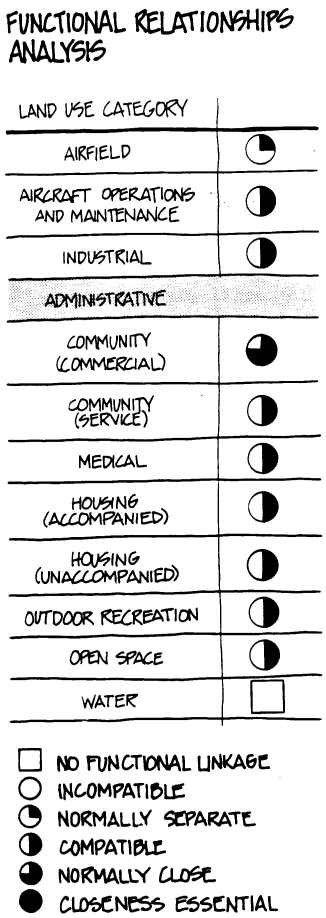


Industrial facilities at Air Force installations include warehouses for various base activities, base maintenance and utilities functions, and base industrial services such as those belonging to transportation, communications, and civil engineering. They ordinarily fall into the following groups: base supply and equipment complex., fuel-related facilities, vehicle maintenance/motor pool complex, base civil engineer complex, open storage, utilities (infrastructure), emergency/disaster response facilities, ordnance and weapons storage areas, and other industrial uses, such as photo lab, test cell, field training detachment, etc.

Functional Relationships. Proximity to aircraft operations and maintenance activities is very important. This arrangement is functionally efficient for a number of reasons: (1) when supply and equipment facilities adjoin the air freight terminal, shipping distance and costs are as low as possible; (2) costs and environmental risks of pipeline transportation of fuel from the storage area to the aircraft operations and maintenance fueling stations are comparatively low; (3) vehicles and vehicle maintenance are as close as possible to the airfield, which uses several types of specialized ground vehicles, and to transients arriving by air and needing ground transportation; and (4) proximity of the fire and disaster teams to aircraft operations and maintenance is also desirable.

Family and unaccompanied housing and medical and community (services) are generally remote from industrial land uses. They are usually kept separate to buffer people from the noise, trucks, and other hazards associated with industrial activities.

Figure 4.7. Administrative Functional Relationships.



Administrative areas are the office complexes on an installation. The administrative land use category takes in wing/group headquarters, civilian personnel, and similar office type activities. It also covers security police operations control, including gate/visitor management and military operations security.

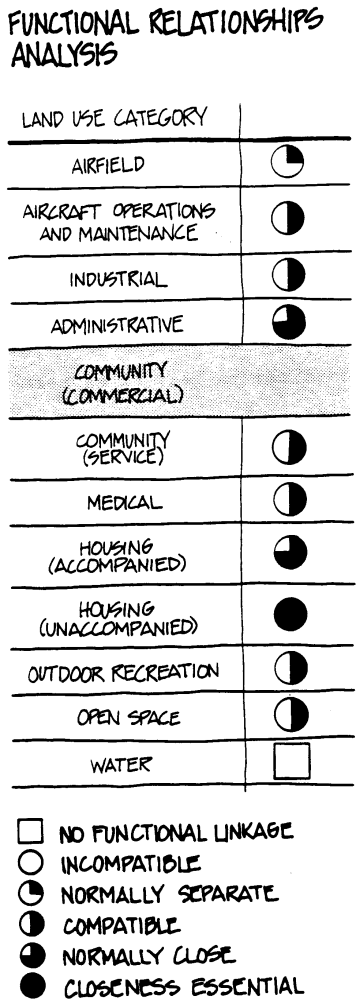
Functional Relationships. Administrative functions are a part of practically all on-base organizations and activities. The critical administrative functions area should be located in a central area of the base for security purposes. It should include headquarters and command office personnel.

Administrative support functions also include personnel pass and ID, staff judge advocate, social actions, public affairs, and reprographics. The latter two functions should be located and placed in the central support area, near base headquarters, for maximum efficiency.

Other major administrative functions include indoor training and academic facilities, ideally sited near unaccompanied housing and the central support area, conference facilities, and research laboratories and test facilities.

Conference facilities can occupy a central or peripheral area, depending on whether or not conference activities are germane to the ongoing activities of the base. If they are located in a central area, a site near the visiting officers quarters/bachelor officers quarters (VOQ/BOQ) housing would be preferable. Research and test facilities may be best sited near the airfield or industrial uses.

Figure 4.8. Community (Commercial) Functional Relationships.



The community center is the central location for the shopping, service, recreation, and day-to-day support needs of base personnel, their families, and military retirees within the area. The Air Force land uses distinguish between the commercial community facilities (discussed here) and the service community facilities (discussed in the next section).

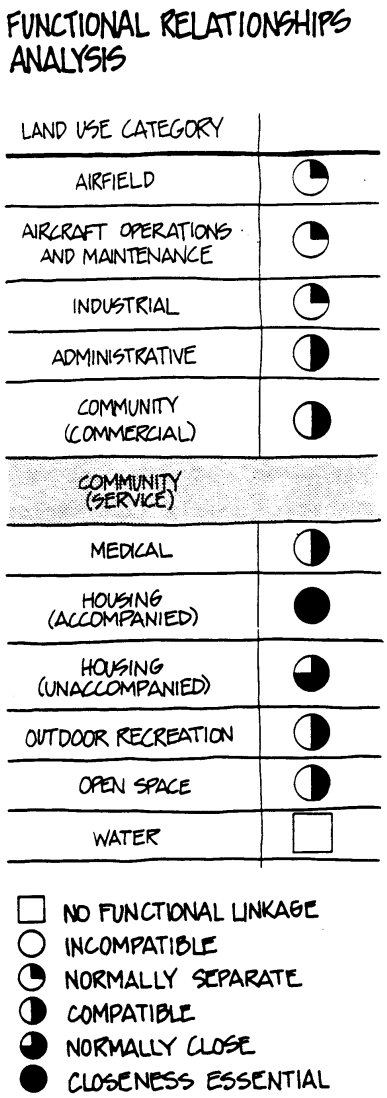
The community center is the "town center" of an Air Force installation. Site of the Base Exchange, (BX), the commissary, clubs, and dining halls, personal services such as barber shops, and many indoor recreational facilities. The community center equates to Main Street, USA, or Main Street Mall, for the civilian population.

Functional Relationships. The community (commercial) and community (service) land uses are very closely linked, and their physical proximity adds to the efficiency and livability of the base. The closeness of these two activities makes it convenient for residents and patrons from off the base to experience one-stop shopping. It also allows people to conduct many kinds of retail business, civic, entertainment, and recreation activities within the same locality.

For those in unaccompanied and visitor quarters, being within walking distance of the community center is beneficial. These personnel often rely on a shuttle system or walking. Convenient placement of facilities accommodates easy access from the unaccompanied/visiting quarters and dormitories to the commercial, recreational, and cultural areas of the base. Opportunities for social interaction are enhanced. Close proximity encourages walking and reduces the use of automobiles.

Indoor recreational uses, including the bowling alley, field house and/or gym, may also be sited in or near the community center.

Figure 4.9. Community (Service) Functional Relationships.

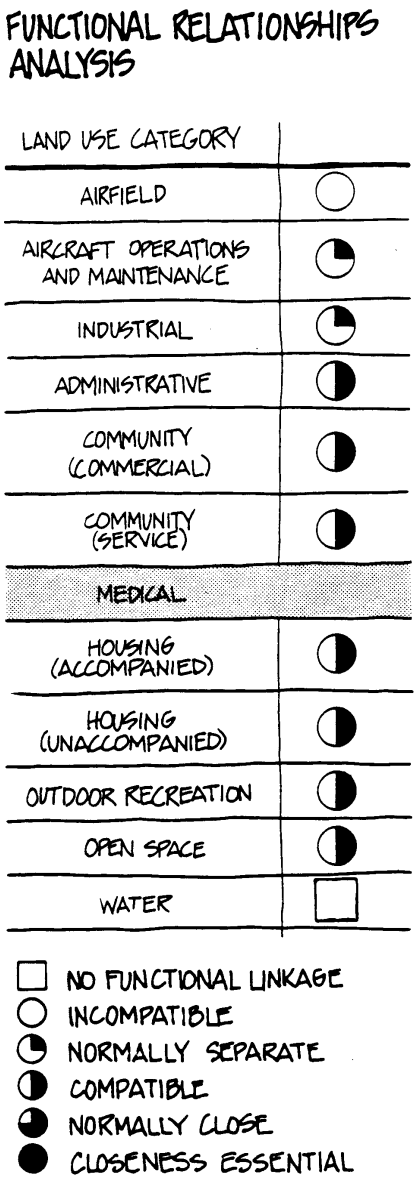


The community (service) category contains activities that support family and personal needs.

Facilities that comprise the service part of community support are as follows: schools (nursery, elementary. junior high, high school); and adult education facilities, post office; library; child care center(s); youth center; chapel; and religious education facilities.

Functional Relationships. Functional relationships between community (service) land uses and other base land uses are substantially the same as those of community (commercial) land uses. Proximity to family housing is more important than closeness to unaccompanied housing (a reversal of the commercial situation), since the services are geared towards families then the single military person.

Figure 4.10. Medical Functional Relationships.

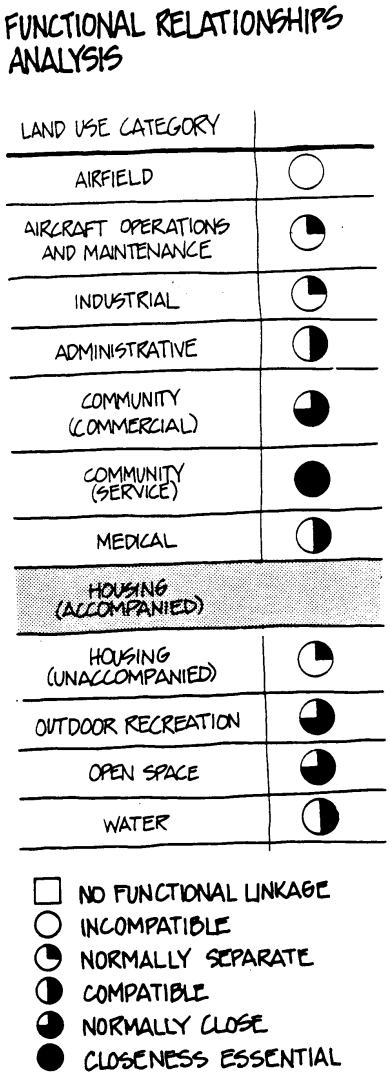


Clinics are available for day-to-day outpatient medical care, extended care, optometry, dental care, and labs uses. These facilities are used by active duty military personnel, retired military and dependents living off-base.

The medical land use includes the hospital, clinics, dental clinic, the BCE hospital maintenance shop, medical storage, and the veterinary care facility. The Red Cross may also be sited with this land use.

Functional Relationships. The health care land use is compatible with both accompanied and unaccompanied housing, the community center land uses, and administrative offices.

Figure 4.11. Accompanied Housing Functional Relationships.



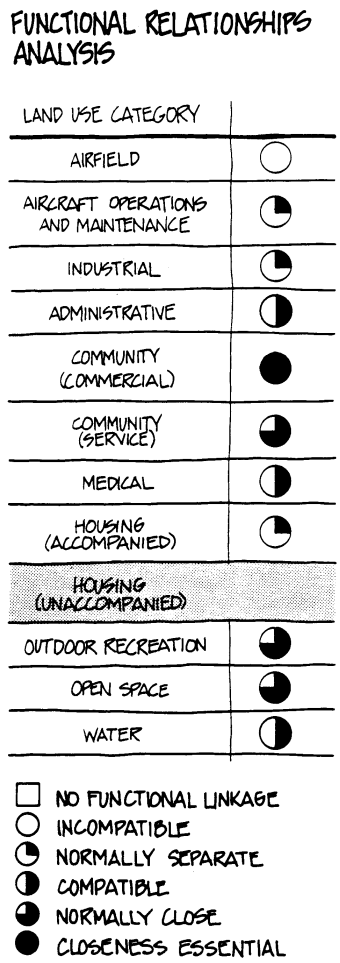
Accompanied housing consists of attached and detached residential units occupied by enlisted and officer families. This land use consists of the following types of housing: family housing; temporary lodging facilities (TLF); TLF support. Mobile home parks are also included in this category.

Family housing developments and TLF can take many forms. These include the traditional arrangement with individual dwelling units, duplexes, the cluster and the planned unit development, the mixed-use development, and others.

Functional Relationships. Accompanied housing has a strong relationship with the community (service) land use. Closeness to schools, child care facilities, the library and post office, and the religious center is beneficial to residents of family housing.

Proximity to the commercial community center, outdoor recreation, and open space is equally important. The commercial community center, in both its abbreviated form as a neighborhood unit and its expanded BX/commissary/other shopping center form, offers a variety of essential goods and also an opportunity to socialize.

Figure 4.12. Unaccompanied Housing Functional Relationships.



There are several types of unaccompanied housing and related facilities that are found on Air Force installations: bachelor officer housing, the airmen's dormitories, and visiting officer and airman's quarters.

Functional Relationships. Ideally, bachelor and visitor housing should be close to the commercial community center.

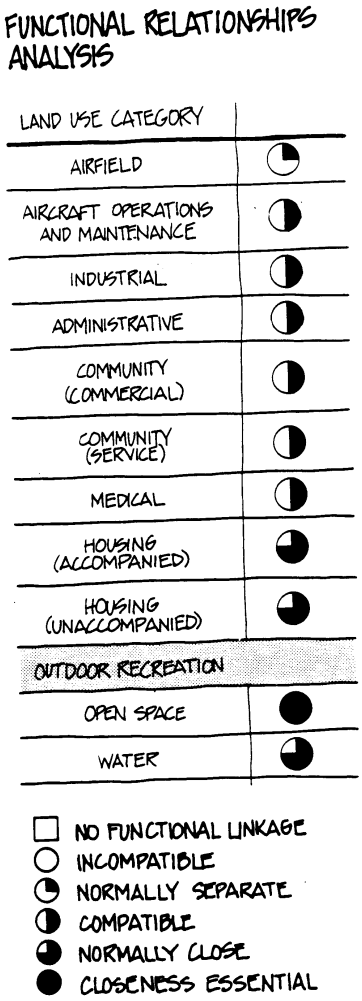
It is important that unaccompanied housing also be located close to the community service center and the administrative areas. While military families are the heaviest users of the community service center, unaccompanied personnel also use the services provided. Many of the unaccompanied personnel often work in the administrative area and thus benefit from proximity to their work place.

The functional relationship with the medical center is less important given infrequency of its use by most individuals of families.

Unaccompanied housing is usually separated from family housing, since many of the interests and schedules of the single members are different.

Unaccompanied housing is also functionally incompatible with the airfield, aircraft operations and maintenance, and the industrial land use for the same reasons as accompanied housing; namely, noise, vibration, traffic, and similar concerns.

Figure 4.13. Outdoor Recreation Functional Relationships.



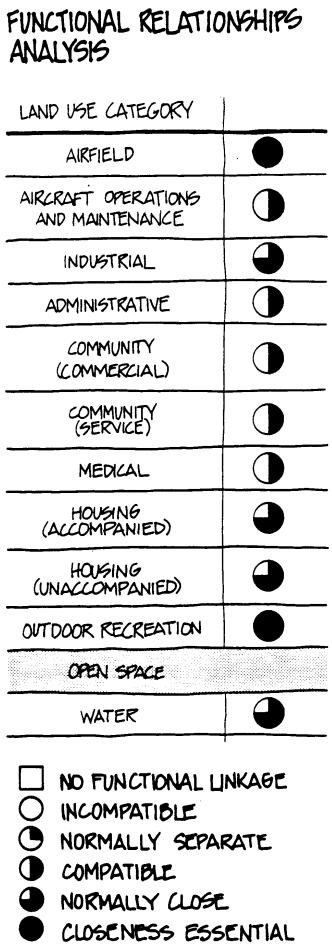
Outdoor recreation facilities are very important to enhancement of the quality of life in the Air Force. There are three basic types of outdoor recreation spaces. Neighborhood recreation areas such as "pocket" playgrounds, parks, and picnic areas are the first type. Low density outdoor recreation areas feature activities engaged in by very small numbers of people at a time. They need little or no facilities support and require little, if any, land disturbance. Examples include picnic areas, jogging paths, etc. Intensive use recreation areas serve activities involving a larger number of people at one time. Examples include golf courses, swimming pools, tennis courts and parks.

Functional Relationships. 0utdoor recreation is most closely linked, naturally, with open space. In one sense, open space may also function effectively as a low density recreation area (i.e., using open space for jogging. cross-country skiing, etc.). In other cases, land preserved for environmental reasons (e.g., flood plains) can also be used for such recreational uses as golf, baseball, etc.

Proximity to water can be very important as water is the focus of many recreational activities. Closeness is also important between outdoor recreation areas and both the accompanied and unaccompanied housing areas, as leisure hours are generally spent at or near home. Thus, easy access to nearby outdoor recreation areas can greatly enhance the quality of life for Air Force personnel. It is often desirable to locate the athletic fields and courts, particularly those for baseball and basketball, near the unaccompanied housing area, as unaccompanied personnel are the heaviest users of these facilities.

Outdoor recreation is compatible with all other base land uses except for the airfield. Because of the need for open space near the airfield, buffer areas have sometimes been used for recreation, but the activities are functionally incompatible. The airfield poses noise, vibration, and other hazards to individuals who seek recreational opportunities nearby.

Figure 4.14. Open Space Functional Relationships.



Open space both separates and defines the various sections of the base and creates the natural setting for all facilities. It can add immeasurably to a site's attractiveness.

Open space may be undeveloped for one of a number of reasons: for buffer space between incompatible uses: is unbuildable due to environmental or physical constraints (flood plain, steep slope, etc.), or required for safety or security clearances.

Requirements for a buffer/clearance zone include the airfield's AICUZ, railroad rights-of-way, utility easements, hazardous waste safety limits, security, and safety distances from ranges and weapons storage areas.

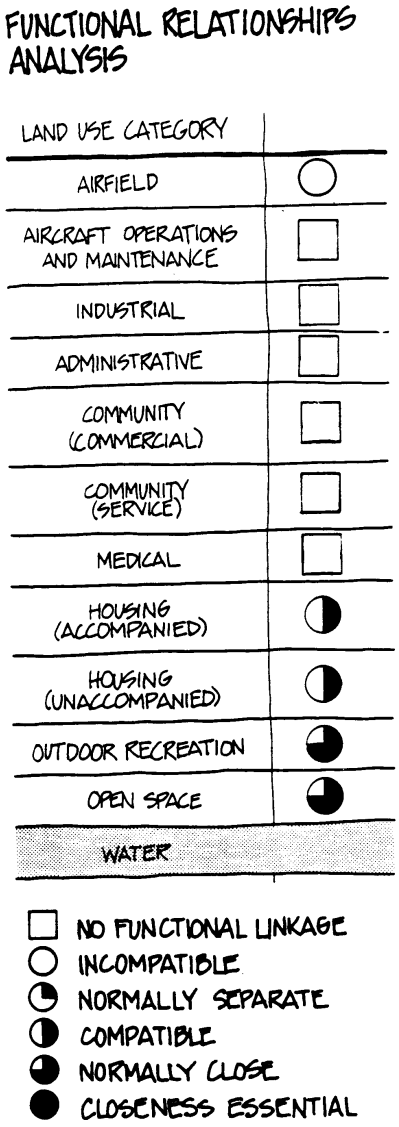
Open space can also meet positive human needs. The underlying justification for most open space has been on health grounds--fresh air, sunlight, recreation, physical exercise, and psychological release.

Functional Relationships. Having open space abutting the airfield is functionally and operationally beneficial. Likewise, open space is often linked with outdoor recreation and clear zones around active munitions operating and storage areas. The presence of open space is also important to residential uses, both military family housing and bachelor quarters.

The location of open space is often driven by the environmental characteristics of the land and the existing development pattern. Land located within defined flood plains and wetlands will usually remain as open space, unless developed for limited outdoor recreational uses. The runway clear zone and other constraints on development dictate what areas will be open space. It should be a conscious base policy to attempt to locate small functional open spaces (i.e., small parks) in the activity centers of the base (e.g., administrative and industrial areas, commercial and service centers).

In the future land use plan, open space is to denote only land that is reserved for natural resources, buffers, or clearances, or that is otherwise unsuitable for development.

Figure 4.15. Water Functional Relationships.

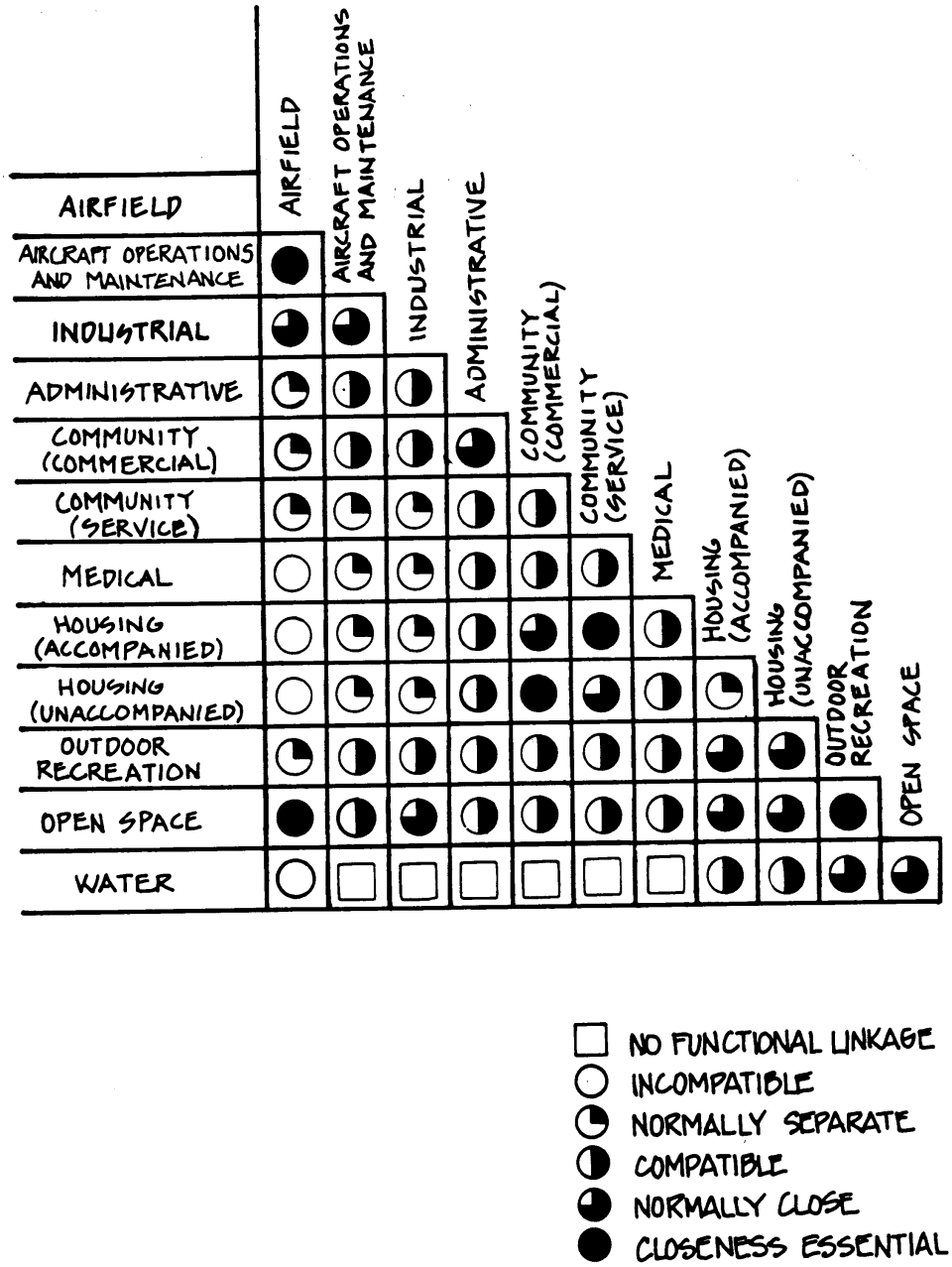


Open water, in the form of ponds, major streams, and lakes on base, or shorefront areas along a river, large lake, or ocean, can be a tremendous asset to the installation's visual opportunities and offers the potential to enhance the image of the installation.

Functional Relationships. The water land use is functionally most compatible with open space and outdoor recreation.

As part of the open space land use, water may help to provide necessary buffer space between incompatible uses.

Figure 4.16. Summary of Air Force Land Use Functional Relationships.



Section 4D—Preparing the Functional Relationships Map

4.6. Mapping Process.

4.6.1. A preliminary step in preparing the functional relationship map is to obtain a copy of Plan Map C-1 (the installation's most recently updated base map). The planner should also obtain a complete list of facilities and structures (USAF Real Property Inventory Detail List, RCS HAF-LEE (AR) 7115). The list will be used to identify and label facilities and structures located throughout the base.

This identification is an important prerequisite to identifying major functional areas. The list will also be needed to determine the types of activities that occur within the major structures.

4.6.2. Functional Land Use Areas. The first step is to identify the major functional land use areas, using the 12 land use classifications presented in Figures B-1 through B-12. Planners should start by consulting any existing planning work (existing land use plans, planning assistance team studies or interim planning framework documents.) Color code individual facilities on Map C-1 based on their functional category. Look for obvious patterns of facilities or activities that are in the same land use category. See Appendix A for facility use land use category alignments.

4.6.2.1. On an overlay sheet placed on top of Map C-1, delineate concentrations or clusters of facilities known to comprise a particular land use class. If the planner decides to print Map D-7, the overlay should be clear mylar. If Map D-7 is not published but is instead used as an internal working map, then tracing paper or vellum can be used for the overlay.

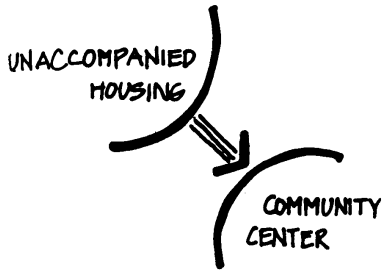
4.6.2.2. Once land use patterns become apparent, they should be outlined. Judgment will be required in terms of what constitutes enough facilities to merit categorization as a functional land use area. Clearly, a small shoppette located in the middle of a family housing area should not be mapped as a community commercial area. The intent should be one of identifying concentrations where one type of land use is so dominant that it determines the collective types of activities.

4.6.3. Community Center. Identification of the community center is extremely important. The Air Force land use classification distinguishes between commercial community activities and service community activities. Planners should attempt to distinguish the two different land use classes, although many of the facilities from the two uses are often collocated. One important reason for identifying both types of community land use is that often facilities in the community commercial are heavily used by persons living off the base, including military retirees shopping at the BX. Thus, transportation access to commercial activities is a greater concern than for the service activities.

4.6.4. Once the major land use areas have been identified, describe in graphic terms the characteristics of the functional relationships, that exist between the different areas. Using the legend shown in **Figure 4.3.** indicate the strength of the functional relationship between different land use categories using the accompanying symbols. The primary relationships shown will involve adjacent land use areas. However, planners should also indicate significant functional relationships between separated but functionally related areas. Professional judgment will have to be used in deciding how many non-adjacent relationships to show.

4.6.4.1. The triple, double, and single lines showing the recommended proximity relationship between different land uses should terminate in arrows that show the direction of the functional relationship, if it is not two-way (**Figure 4.4.**). If space is available and the map does not become too cluttered, planners may wish to label some of the significant functional relationships that describe the properties of flows between functional land use areas.

Figure 4.17. One Way Functional Relationship.



4.6.4.2. There is a very strong relationship between the base transportation system and the base land use pattern. The transportation system determines to a very significant extent the accessibility and efficiency of flows between different land use areas. For this reason it is recommended that planners also show on the functional relationship map major and minor auto circulation routes, and pedestrian routes and flows.

4.6.4.3. At this point the functional relationship map should resemble **Figure 4.5.** The major functional land use areas have been delineated, and the character of the functional relationships has been shown graphically. The major and minor transportation routes should be shown.

4.6.4.4. The functional relationship map is used to analyze and identify problems and opportunities in developing the future land use plan. Planners should examine the map to see if situations exist where functionally related land uses or similar activities are located too far from each other. Planners should be alert to opportunities to consolidate compatible activities within functional land use areas. Finally, planners should look for individual functions or structures that are located away from the functional area closely related to them.

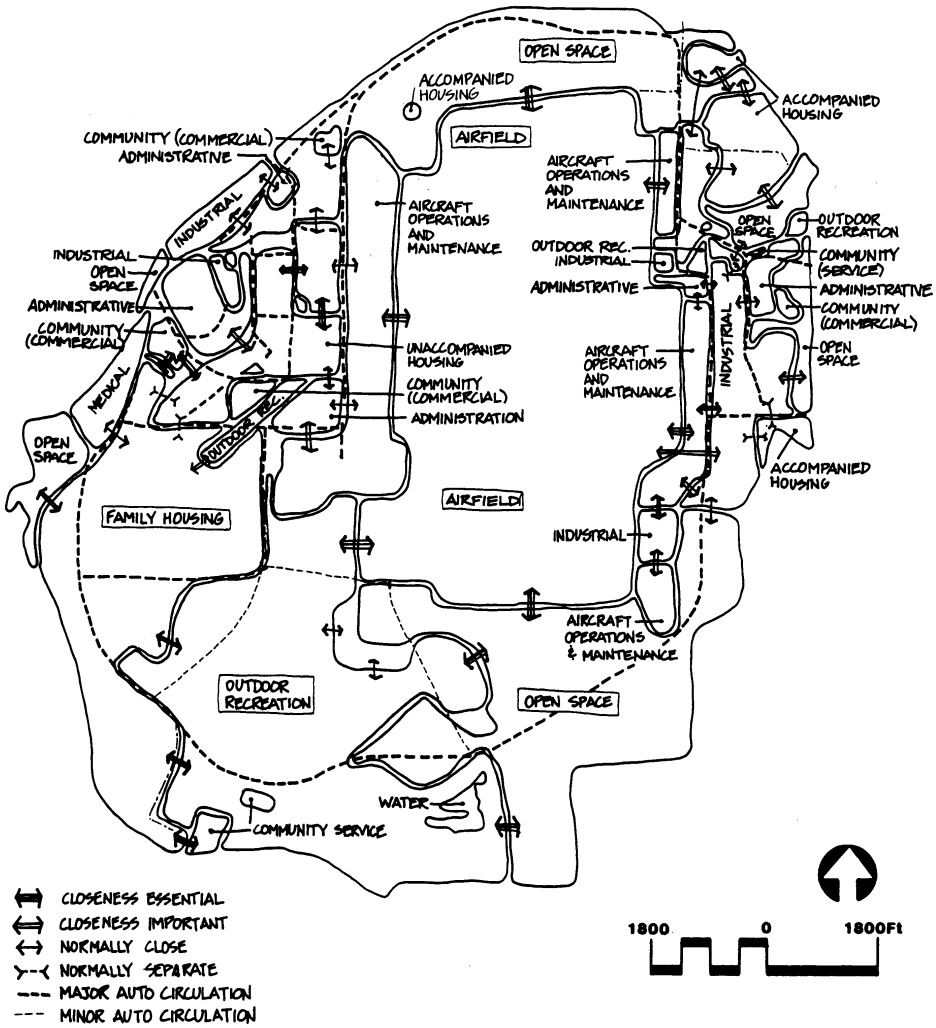
4.6.4.5. Once the functional land use areas have been delineated, the major structures and activities within each functional land use area should be identified. It is recommended that the outline of each functional area be drawn on a separate sheet of vellum. The major facilities and structures located within each functional land use area should then be labeled on these other drawings, which can serve as working maps to provide additional detail to the overall functional relationship map.

4.6.4.6. Planners should consider identifying the major activities and structures within some of the larger functional land use areas. These include such land use categories as administrative, community commercial, community service, industrial, and aircraft operations and maintenance areas, which have the largest number of different activities performed within them. This diversity implies the existence of heavy or highly differentiated uses within the land use category.

4.6.4.7. This level of analysis is required in developing coherent plans for activity complexes having either heavy flows between activities located within the complex (i.e., the industrial area), or heavy flows into and out of the complex (e.g., the community center).

4.6.4.8. Within major land use concentrations, this analysis indicates the important flows and dependencies that occur at major activity centers. The details of this analysis may indicate potential opportunities for consolidating functionally related or compatible activities within a single structure.

Figure 4.18. Functional Relationship Map.



Chapter 5

PREPARING THE FUTURE LAND USE PLANS

Section 5A—Approach to the Future Land Use Plan

5.1. Key to the Land Use Plan.

5.1.1. A key step in the planning process is to create a future land use plan. This is the document that will present in graphic form what the plan describes in written form: the desired future land use patterns of the Air Force installation. Appendix B shows an example of the future land use plan.

5.1.2. The drafting of the future land use plan is an integrative process in which the planner considers a wide range of information and attempts to meld it into a coherent document. In a fundamental sense, this part of the land use process is a combination of art and science. The "art" of land use planning in large part relates to the attempt to answer the question of what we want the future to bring. This is clearly a value-laden and subjective question that attempts to reconcile competing goals and objectives about a future, desirable end-state (i.e., what constitutes a desirable and efficient land use pattern at some point in the future).

5.1.3. The "science" of land use planning comes from the need to consider and incorporate into the plan both operational requirements and the opportunities and constraints of the natural, built, and socio-cultural environments. Planning principles concerning the compatibility of different land uses, energy conservation, and the functional relationship of different land uses will all tend to shape a land use pattern. Similarly, the location of utilities, the characteristics of the on-base transportation system, and the location of sensitive environmental features will also determine land use pattern.

5.2. Sample Situation.

5.2.1. The drafting of the future land use plan will more likely be an evolving process in which alternative plans are drafted and then reviewed and modified based on information already assembled. For example, the planner may define a larger community center based on a goal of consolidating presently scattered facilities in a more functional area, and on the clearly recognized need to expand the current BX and commissary facilities.

5.2.2. Following this initial step, the planner would then examine other information sources such as the functional relationship map, proposed capital improvements, the transportation plan, proposed demolition's, etc. to see how they would affect and/or interact with the proposed community center area. Based on this information, and the input from other base personnel, the planner could then maintain or adjust the area of the proposed future community center. This process would be duplicated for other land use areas of the base.

5.2.3. It is difficult to give a present "how to" method for developing the future land use plan. However, descriptions of basic steps that should be used in developing the future land use plan, along with questions and considerations that base planners should incorporate into their decision-making process, are presented in the next sections.

Section 5B—Assemble Data Inputs

5.3. Assembly and Integration of Information. At this point in the process, the base planner will need to assemble and integrate the information from the following sources in pre-paring the future land use plan:

5.3.1. The land use planning goals and objectives.

5.3.2. The needs assessment, which identifies key issues and problems which must be addressed through land use planning.

5.3.3. The analysis of functional relationships.

5.3.4. The analysis of constraints and opportunities.

5.3.5. Map D-l, Existing Land Use.

5.3.6. Other comprehensive plan components, particularly the transportation, AICUZ, long-range facilities development, capital improvement, utilities, and natural and cultural resources plans.

Section 5C—Preliminary Plan of Future Land Use Areas

5.4. Development of a Preliminary Plan. At this point, a preliminary plan of future land use areas is developed. This should be done on a copy of Map C-1. It should be based on the composite overlay of the functional relationship, existing land use, and constraint maps.

5.4.1. Once this draft plan has been completed it, should be reviewed by civil engineering personnel who will access it from their specialty area perspective.

5.4.2. The draft plan should address the following:

5.4.2.1. Land Use Goals and Objectives.

5.4.2.1.1. Will the proposed land use pattern result in the achievement of the land use goals and objectives?

5.4.2.1.2. Would the proposed land use pattern be functionally efficient and effectively support the base mission?

5.4.2.2. Needs Assessment.

5.4.2.2.1. Are there specific known needs that will have to be met to ensure the base can perform its mission (e.g., a new hangar, increased aircraft operations and maintenance facilities, etc.), or to enhance the quality of life (e.g., of shortage of family housing units, deficit of recreational resources, etc.)?

5.4.2.2.2. Are there specific construction projects planned to meet functional area requirements?

5.4.2.2.3. If so, where will these structures, facilities, etc., be located and how will they affect the existing and use patterns?

5.4.2.3. Functional Relationships.

5.4.2.3.1. Are there any instances of functionally related land uses that would benefit from increased proximity?

5.4.2.3.2. Are there any obvious examples of incompatible land uses located next to one another?

5.4.2.3.3. Are there instances where the efficiency of flows between functionally related land uses could be improved other than by increased proximity (e.g., pedestrian walkways, improved transportation system)?

5.4.2.4. Planning Factors.

5.4.2.4.1. Are there opportunities to enhance physical security and protect against terrorism?

5.4.2.4.2. Are there opportunities for combining functionally related or compatible uses within a single structure?

5.4.2.4.3. Is demolition of obsolete structures planned such that developable land may become available?

5.4.2.4.4. What are the constraints on development imposed by environmental factors?

5.4.2.4.5. Are there important characteristics of the base and its resources that should be preserved?

5.4.2.4.6. What is the location and capacity utilization of on-base utility systems? Are they capable of accommodating additional development?

5.4.2.5. Other Components of the Comprehensive Plan.

5.4.2.5.1. Is expansion planned for on-base utility systems? If, so, what areas of the base will be served?

5.4.2.5.2. What new construction and replacement activities are planned under the long-range facilities development plan?

5.4.2.5.3. Does the transportation plan identify deficiencies in the on-base transportation system? If so, what changes are recommended?

5.4.2.5.4. What facilities are recommended under the short-term capital improvement plan? Where would they be located?

5.5. Draft Future Land Use Plan . The above list of questions is at best a brief indication of what the that base planners will have to take into account in amending and shaping the preliminary draft of the future land use plan. As the draft plan is reviewed and modified, new considerations will arise that will have to be addressed. As planners continue to examine the preliminary plan in light of the above information sources, the final future land use plan will begin to emerge.

5.6. Review and Comment. Input from other groups will be crucial to preparing a future land use plan that is a true consensus document the command structure will be willing to adopt and implement. A preliminary version of the final future land use plan should be circulated to various organizations on the base for their review and comment. Those receiving preliminary versions should include:

5.6.1. The installation commander.

5.6.2. The base civil engineer.

5.6.3. Commanding officers and representatives of tenant units located on the base.

5.6.4. Representatives of all major base organizations.

5.6.5. Directors or managers of major on-base facilities such as the BX, the commissary, hospital, school, etc.

5.6.6. The base communications (information system) organization.

5.7. Final Future Land Use Plan on Map D-1.1. After receiving this input, the base planner is then responsible for producing the final version of the future land use plan (Map D-l.l). This plan must be prepared in accordance with the requirements of the Air Force's Base Comprehensive Plan Master Statement of Work. This document contains specific standards concerning size, legends, colors, symbols, and information content of this map.

Chapter 6

RELATING TO NEIGHBORS AND REGIONS

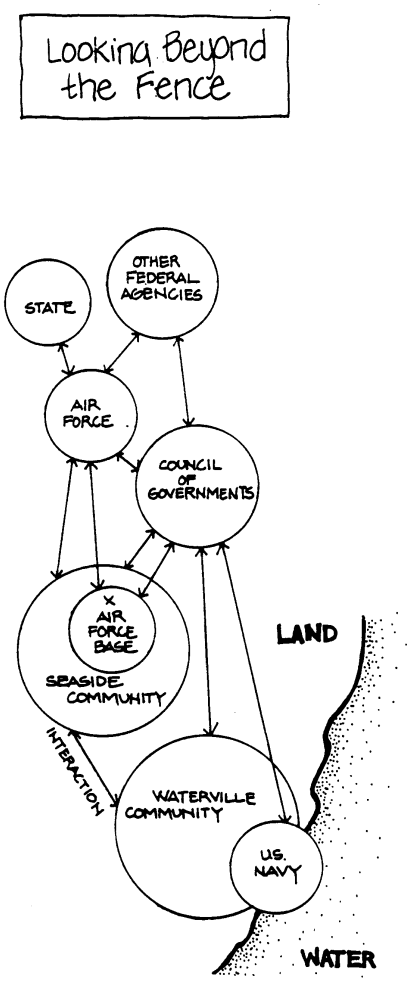
Section 6A—Bordering Land Uses

6.1. Attitude and Issues .

6.1.1. An air base is a fairly complex community in its own right. It has a full range of land uses and services and, in some cases, could be compared to a small to mid-size community were it not for the airfield and perimeter fence. Planners must consider what happens beyond the fence. An Air Force installation clearly has a significant indirect affect on land use adjacent to the base, and ignoring the interactions between the installation, bordering land uses, and regional trends would be shortsighted.

6.1.2. The base planner has to be aware of all facets of the land use situation in areas surrounding the installation and beyond (**Figure 6.1.**). Issues that require consideration are as follows:

Figure 6.1. Regional Interaction.



6.1.2.1. Adjacent land uses.

6.1.2.1.1. What is the current land uses adjacent to the installation? What trends exist to influence the types of future adjacent land uses?

6.1.2.1.2. Do these current land uses create any problems with regard to the mission, either at present or possibly in the future?

6.1.2.1.3. Are adjacent land uses compatible with Air Force land uses?

6.1.2.1.4. What are future plans for undeveloped properties adjacent to the installation??

6.1.2.1.5. What are the land use policies and plans as expressed in local community zoning ordinances, comprehensive plans, etc.?

6.1.2.1.6. What plans or proposals exist for future development, provision of infrastructure, etc., that could significantly change the type and intensity of adjacent land uses?

6.1.2.1.7. Do future mission changes pose a problem with respect to the local communities present and future development plans?

6.1.2.2. Regional land use.

6.1.2.2.1. Is the base in the path of a clearly definable growth corridor?

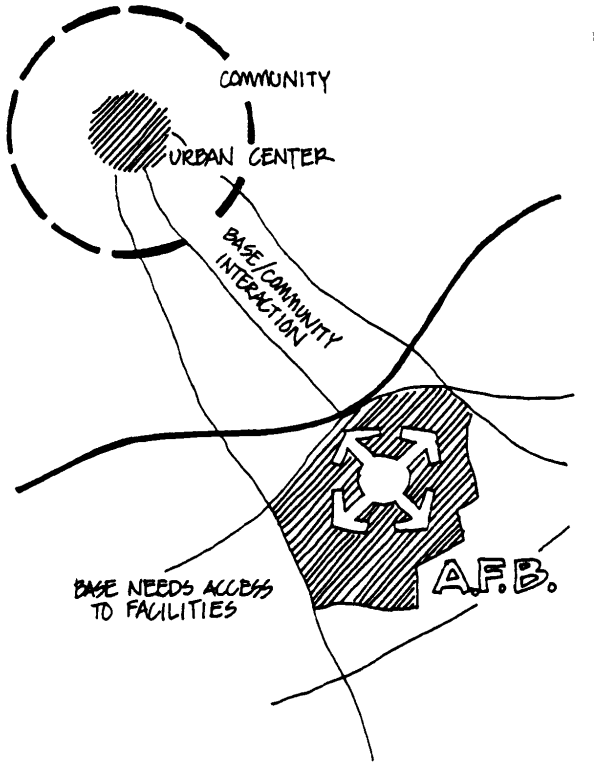
6.1.2.2.2. What is the base's proximity and access to transportation, sewer, water, electricity, gas, etc. (**Figure 6.2.**)?

6.1.2.2.3. What is the setting of the base within the urban, suburban, suburban/rural fringe, rural agricultural, etc.)?

6.1.2.2.4. What are the recommendations, projects. etc., contained in regional plans (i.e.. solid waste management plans, water quality management plans, transportation plans, etc.)?

6.1.2.2.5. What is the proximity to regionally to regionally important facilities and services (i.e., central business district of an urban center, museums and other cultural facilities, shopping malls, mass transit stations, major out-door recreation facilities)?

Figure 6.2. Regional Context.



6.1.2.2.6. What is the dominant regional land uses?

6.1.3. Originally selected for their rural remote location from populated areas, air base sites are increasingly encroached by suburban growth from once distant urban centers. Also, the air base is a magnet of some size, attracting residential and commercial development to serve the base and its employees and residents.

Section 6B—The Larger View of the Base within the Region

6.2. Working with Neighbors.

6.2.1. In the same way the planner endeavors to retain the flexibility to accommodate changing missions or manpower surges on base, he or she must work with planners in neighboring jurisdictions to ensure that development around an air base is compatible with base operations. Likewise, keeping the civilian planners aware of the base's goals, objectives, and plans for the future gives them information they can use to foster compatibility along the boundary between military and civilian property.

6.2.2. The process of developing and implementing a future land use plan also requires the establishment of a continuing working relationship between the base planner and public officials of neighboring governmental units. Just as land use planning is more than just producing the plan, relating to neighbors and the region is more than simply reviewing local land use plans from time to time.

Chapter 7

MAKING THE PLAN WORK

Section 7A—Implementation

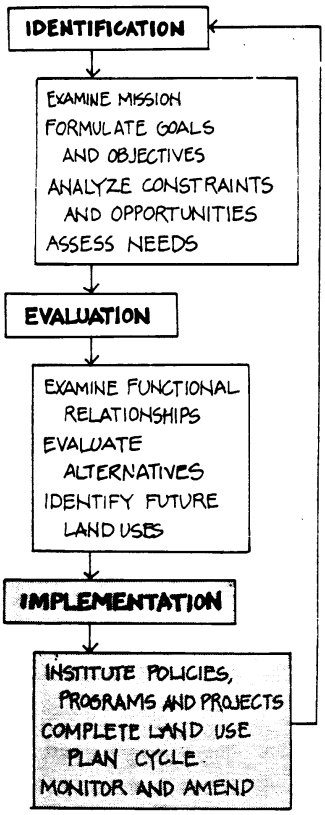
7.1. Third Phase of Air Force Planning.

7.1.1. The final part of the Air Force land use planning process is the implementation phase. This phase marks the transition of land use planning from development of a plan to the process of implementing it. Three major activities are conducted during this phase:

7.1.1.1. Developing specific policies, programs, and projects that will implement the future land use plan.

7.1.1.2. Incorporating the land use plan into other planning tools; e.g., General Plan.

7.1.1.3. Controlling future base development by ensuring that future actions are consistent with the land use plan; in particular, that facility siting and the provision of infrastructure conform to the plan.



7.1.2. It is important to note that land use planning for an Air Force base will not take place as a completely independent task, but will instead be part of the overall base comprehensive planning process. Similarly, the land use plan will be integrated into the comprehensive plan.

Section 7B—Developing Policies, Programs, and Projects

7.2. Timing and Execution. The development of specific policies, programs, and projects to implement the land use plan will occur over time. As noted earlier in **Chapter 3**, the process of assessing needs will naturally lend itself to the subsequent development of specific implementation measures. Similarly, the analysis of functional relationships may also lead to the identification of obvious ways of enhancing flows between land use areas.

7.3. Sources of Information .

7.3.1. The base planner at this point should begin assembling the future land use plan and the statement of land use goals and objectives and begin to develop the specific policies for implementing the land use plan. The following are sources of information to be referred to in developing these implementation policies:

7.3.1.1. Five-year Defense Program.

7.3.1.2. Proposed capital development projects.

7.3.1.3. Installation/local needs assessment.

7.3.1.4. Base profile.

7.3.1.5. Interim planning framework.

7.3.1.6. Planning Assistance Team (PAT) reports.

7.3.1.7. Natural and Cultural Resource Plans.

7.3.1.8. Local/regional plans and policies.

7.3.2. The development of policies, programs, and projects will be a collaborative effort which requires input from the base facilities board, the base civil engineer, the base commander, and representatives from base organizations. This effort will likely go through several iterations as the base planner or the base civil engineer develops specific recommendations for policies, programs, and projects, and reviews them with the other relevant parties. Planners should, refer to the comprehensive plan components to ensure that the initial policies, etc., are consistent with these elements. Where they are not, modifications will be required.

7.4. Base Policies. Each base will have to develop its own set of policies, programs, and projects that are responsive to the unique characteristics found at the installation. It is thus impossible to provide in this document a set of overall Air Force-wide measures commonly used to implement a land use plan. Representative examples of land use policies are presented below.

7.4.1. Policy: Eliminate conflicting land uses that adversely impact family housing.

7.4.1.1. Project: Functions located in buildings 1170 and 1171 must be moved and the structure demolished.

7.4.1.2. Project: Noise attenuation buffers should be constructed to reduce sound levels transmitted to family housing areas.

7.4.2. Policy: Provide for better use of the floodplains that traverses the housing area.

7.4.2.1. Project: Provide court and turf games in the floodplains that would expand the present recreation opportunities while withstanding periodic inundation.

7.4.3. Policy: Provide adequate family housing

7.4.3.1. Project: Construct an additional 110 units of military family housing.

7.4.3.2. Project: Construct housing at present site of the family camp and the ball fields. Move ball fields and camp to a more centralized location.

7.4.4. Policy: Improve unaccompanied housing facilities.

7.4.4.1. Project: Construct new airmen dorms near the existing airmen's dining hall.

7.4.5. Policy: Relocate all recreation facilities according to functional groupings.

7.4.5.1. Project: Relocate playing fields from west of the flight line to the housing areas.

7.4.5.2. Project: Relocate athletic courts to the hospital, family housing, and bachelor housing areas.

Section 7C—Incorporate the Land use Plan into the Comprehensive Plan

7.5. Land Use Planning--Part of the Comprehensive Plan.

7.5.1. Once a comprehensive set of policies, programs, and projects has been developed, the land use plan must be incorporated into the larger comprehensive plan. As noted previously. land use planning will not be performed independently of other planning activities, but will instead be a part of the entire comprehensive plan planning process.

7.5.1.1. It is imperative that planners ensure that the land use plan is consistent with the other components of the comprehensive plan, particularly the natural resources plan and the transportation plan. The natural resources plan shows the present use of special land areas and major constraints such as soil capabilities, floodplains. wetlands, habitats, and unique natural areas. The on-base transportation system determines the connectivity between different land uses.

Section 7D—Monitor On-Base Development

7.6. Using the Plan.

7.6.1. The final part of the land use planning process will be to continually implement the plan (along with the rest of the comprehensive plan) as a means of controlling on-base development. The most important role of the land use plan will be to ensure that new buildings and facilities are located according to the future land use plan and adopted base policies. It will also be used so that the future development of transportation improvements, utilities, etc., conforms to the plan. and existing beneficial uses are retained.

7.6.2. The land use planning process incorporates several feedback loops that represent the need to continually update the plan. As new facilities are constructed and improvements occur, the plan will have to be modified to reflect these changes.

7.6.3. Once a plan has been completed and approved. the battle has only been partly won. The true test comes in living with the plan and using it as the primary means to guide future development of the installation. Planning history is full of examples of elaborate, finely detailed plans that were essentially obsolete from the moment they were approved. In numerous other instances, plans have become "shelf" documents that are rarely, if ever, used for their intended purpose.

7.6.4. A key point to remember is that comprehensive planning is an ongoing process that continues once the initial plan has been conceived and adopted. A plan in published form is necessarily time-limited as an expression of the collective thoughts of the affected community on its desired end state. In order for a land use plan to have the intended effect of guiding an installation's future development, provisions must be made for updating the plan on a continuing basis.

Section 7E—The Organic Plan

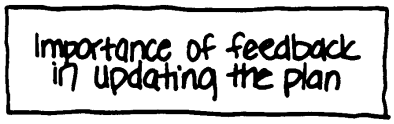
7.7. Plan Updates.

7.7.1. The process of implementing the land use plan on an ongoing basis must be accompanied by a corresponding effort to keep it relevant. The planning process must be able to accommodate changing conditions on a installation, incorporate them into the plan, and change plan recommendations where required.

7.7.2. Changes in mission can have significant impacts in terms of the facilities required to support new directions. Technological advances in weapons systems will clearly change the type of support facilities required on an installation. Similarly, expansion of an installation's mission and the corresponding assignment of substantial numbers of new military personnel to an installation will place significant new demands on community center, housing, medical, and other facilities.

7.7.3. Advances in technology, growth of the surrounding region, and the accumulation of new information can all have impacts that must be accounted for in the land use plan. For example, advanced building construction techniques and energy management may make it possible to consolidate activities within a new structure that would not have been considered before.

7.7.4. Likewise, a decision by an off base community to extend utility lines out toward the base would have growth implications that would have to be considered by the installation. Such a decision could force the installation to reconsider the type of long-range development proposed for areas near the installations border and make it more compatible with future off-base development.

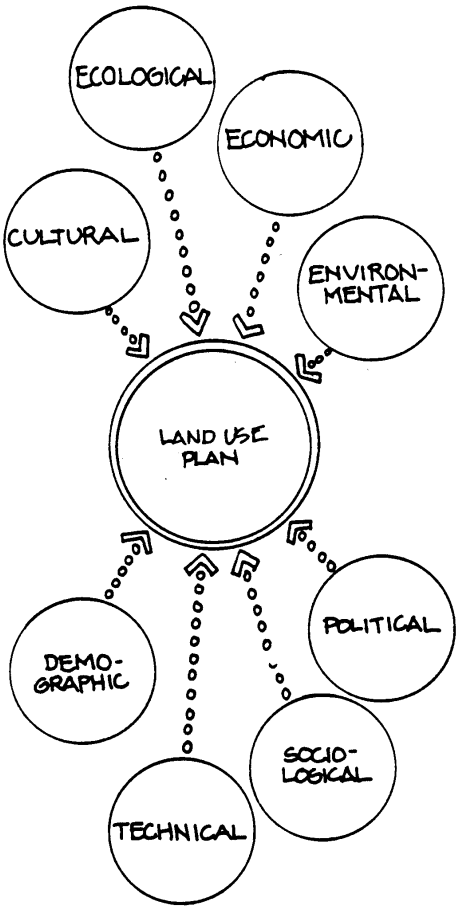


7.7.5. It is extremely important that a planning process include a feedback loop so that new information can be incorporated. The acquisition of new data may require planners to reformulate some of the

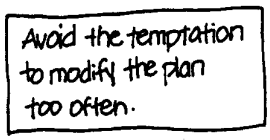
original goals and objectives in order to more accurately address the needs of the changing Air Force community. Adopting a particular policy or program called for by the land use plan may lead to the discovery of unanticipated adverse impacts that have to be corrected, or it may turn out that a particular project has created an unanticipated opportunity for improving the installation's quality of life, a benefit that can be realized with minimal expenditure for new facilities.

7.8. Annual Reexamination of the Plan. The planning process should include an annual re-examination of the plan. The primary vehicle for doing this is the base facilities board, with the primary input coming from the base civil engineer and the base planner. The goal should be to improve the plan by keeping it responsive to changing conditions and needs. Opinion and input should be solicited from all sectors of the base community, so that the board can maintain a perspective on the points of view of all affected. Influences on the plan are shown in **Figure 7.1.**

Figure 7.1. Influences on the Plan.



7.8.1. It should be noted that there is a distinction between amending a plan in light of new information or changed circumstances and altering the plan because somebody finds it difficult to live with the recommendations. The former is a legitimate exercise that must be a part of any planning process. The latter may lead to a misshapen and irrelevant document that bears no relationship to the needs of the Air Force community. Plans must be followed in order to guide an installation's development toward a well-ordered future.



7.8.2. Adhering to Plan. The ultimate test of any plan is the extent to which an Air Force installation applies it on a continuing basis as a guide to on-base development. The plan must be relied upon for the resolution of siting issues, enhancement of the functional efficiency of the land use patterns, and improvement of the quality of life of base residents and employees. The challenge is to comply with the plan's requirements and update it to reflect changing conditions, all without sacrificing the plan's vision.

WILLIAM P. HALLIN, Lt General, USAF
DCS/Installations and Logistics

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Attachment 2

EXAMPLE LAND USE PLAN

This attachment illustrates key components of a land use plan for a hypothetical installation place: Hometown Air Force Base. Comments to the reader are boxed to distinguish them from the Hometown AFB illustration. The basic outline of a land use plan is followed:

Planning Process

Plan Goals and Objectives

Regional Profile

Existing Conditions

Constraints, Deficiencies, and Opportunities

Future Land Use Plan

Each installation will have different circumstances than those discussed here. This appendix is presented as an example, not as a prototype of how all land use plans must be done.

A2.1. LAND USE PLAN FOR HOMETOWN AIR FORCE BASE. This component of the installation's Comprehensive Plan describes the land use planning process, land use goals and objectives, the regional profile, existing land use conditions, and significant constraints to and opportunities for future land use development at Hometown Air Force Base.

A2.2. LAND USE PLANNING PROCESS. In order to develop a frame of reference for evaluating existing land uses and recommending future land uses, a land use reconnaissance was undertaken at Hometown AFB to define major land use categories and activities. The findings of this reconnaissance were then compared with general Comprehensive Plan guidelines and existing data available from the base civil engineer. This was followed by a more detailed survey of land use and the development of land use planning criteria, which resulted in the identification of specific and general land use planning opportunities and deficiencies at the base.

A2.2.1. The principal factors affecting proper land use planning at Hometown AFB are discussed below. The discussion is supported by illustrations, which provide more detailed information in evaluating land use. Section 2 presents the results of the detailed land use survey referred to previously.

A generic description of each land use category that occurs at Hometown AFB could appear here. Functional relationships among these uses would be analyzed, as illustrated by **Figure 2.1.** The planning process, including who was involved, would also be described.

A2.3. LAND USE PLAN GOALS AND (OBJECTIVES). The goals and objectives that guided development of Hometown AFB`s land use plan are enumerated below.

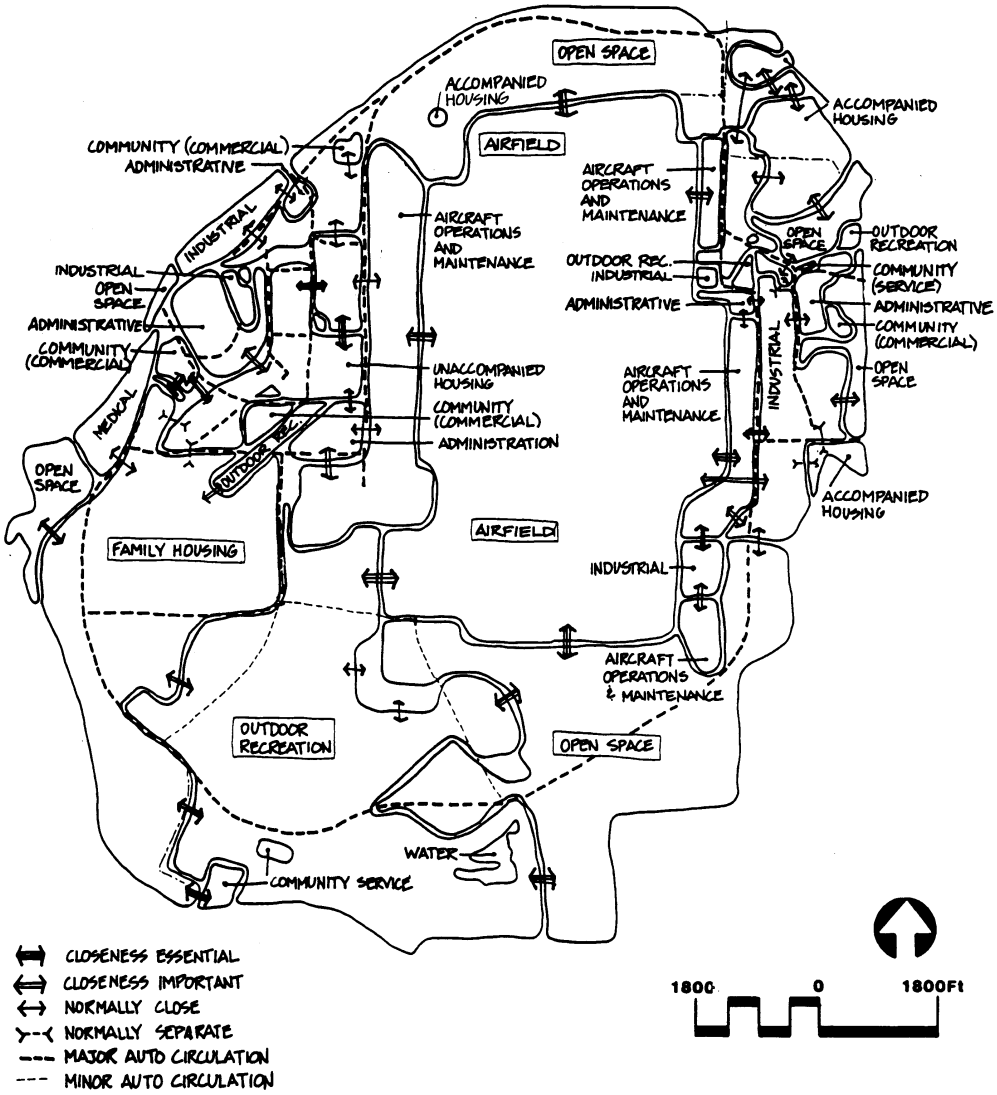
A2.3.1. Promote the most functional and efficient land use pattern.

A2.3.1.1. Promote the ongoing development of functionally-related land use complexes or nodes by consolidating presently scattered, compatible activities in larger and more efficient structures.

A2.3.1.2. Ensure ability to perform the base's mission by controlling rapidly increasing demands for apron frontage.

A2.3.1.3. Correct existing land use incompatibilities such as the proximity of industrial uses to family housing in several areas of the base.

Figure A2.1. Hometown Air Force Base Functional Analysis.



A2.3.2. Plan for future growth and change

A2.3.2.1. Evaluate and consider on-base space requirements from other government agencies in light of future mission changes.

A2.3.2.2. Free land for future expansion by consolidating functionally related activities in more efficient complexes.

A2.3.3. Promote compatible, and coordinated, land use decisions and policies by federal, state, county, and local agencies.

A2.3.3.1. Establish a regular mechanism for review of major Air Force and civilian development proposals that could significantly affect the future use of base or adjacent lands.

A2.3.3.2. Rapid growth in the immediate vicinity of the base and its potential impact on the base's mission must be taken into account.

A2.3.3.3. Assure the installation's AICUZ report reflects current information and encourage local community adoption of compatible land use controls.

A2.3.4. Enhance the base's visual and aesthetic image.

A2.3.5. Maximize the well-being and quality of life of on-base personnel and residents of adjacent, off-base areas.

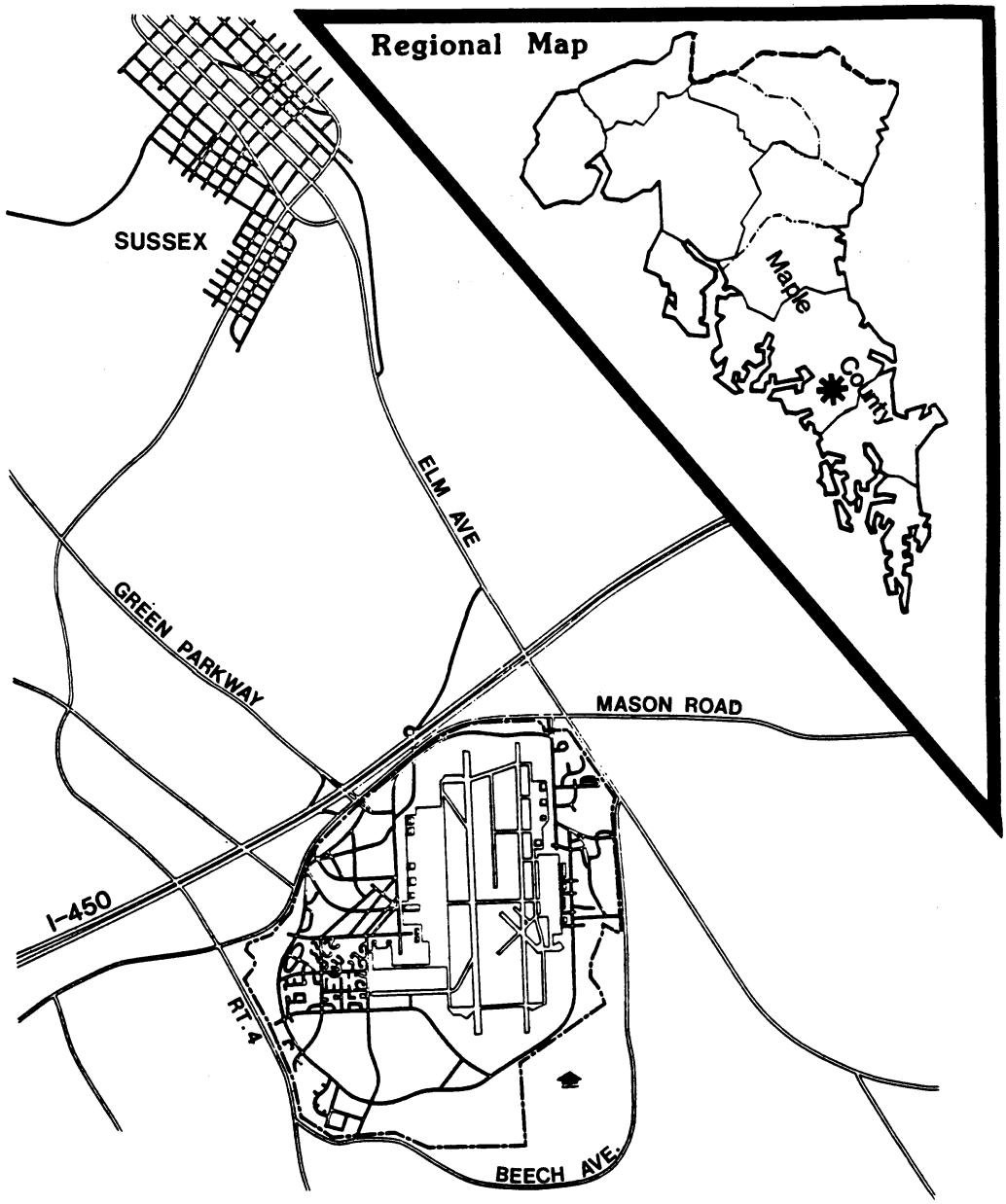
Goals and objectives would be consistent with those set forth for the entire Comprehensive Plan.

A2.4. REGIONAL PROFILE. Hometown AFB is located near the center of Maple County. It is ten miles southeast of the city of Sussex, and is located just outside Interstate 450, which encircles Sussex. Just inside the Interstate to the north and northwest of the base are a number of residential communities with a variety of low- and medium-density housing. Lower-density residential areas and a U.S. Navy radio receiving station are located east and south of the base. The Green Parkway and State Route 4 intersect near the northeast corner of the base and lead to downtown Sussex in one direction and to U.S. Highway 801 in the other (Figure A2.2.).

A2.4.1. Maple County was one of the nation's largest and fastest-growing counties during the last decade and is still growing today. It typically costs less to live in Maple County than in other suburbs of Sussex, a major factor encouraging growth. The growth of Hometown AFB has also contributed to county growth: the base now hosts more than 19,000 active duty military personnel, dependents, and civilian employees. This has had a positive impact on the economy of the county and the entire region, but has also placed many demands on county services.

A2.4.2. Considerable potential for major conflicts between flight operations and county growth exists. To ensure the long-range viability of the base and minimize these conflicts, a comprehensive study of aircraft noise and accident potential zones was conducted in the early l970s and publicly released in December 1974. This study establishes an Air Installation Compatible Use Zone (AICUZ) for Hometown AFB that county planners have used to try to control development near the base. The base's two parallel runways run directly north and south. As a result, the Hometown AICUZ extends directly north to the vicinity of the U.S. Highway 100-Sussex Interstate interchange; it extends directly south almost to the intersection of State Route 4 and U.S. Highway 801. When the AICUZ study was released, there were already many existing land uses that conflicted with the land use recommendations in the study. Future growth of the county will make it increasingly difficult to fully implement AICUZ objectives, despite significant progress since 1974.

Figure A2.2. Hometown Air Force Base Location Map.



A2.4.3. Housing costs near Hometown AFB are much higher than at other Air Force installations and school busing is also more extensive. Off-base apartments and rental townhouses typically range in cost from $485 to $700 per month for one-bedroom units to $750 to $950 per month for three-bedroom units. Sale prices for two-bedroom, single-family homes usually begin at $110,000 to $120,000. Many military families, therefore, prefer to live in one of the 2,084 conventional family housing units or 212 mobile homes on base, even though either choice usually entails waiting several months to move on base and thus requires two moves. Others commute long distances to lower-cost housing areas to the south and east of the base. Military family dependents attend 11 different elementary schools, three junior high schools, and one senior high school. Only one elementary school is located on base.

A2.5. REGIONAL ANALYSIS. The growth of Maple County and downtown Sussex will have an even greater impact on Hometown AFB in the next 20 years than it has had in the past. This impact will affect access to the base, aircraft operations, housing, schools, and related issues such as environmental concerns and the overall quality of life.

A2.5.1. Highways in the immediate vicinity of the base are generally well- designed and in excellent condition. They provide easy access to the base at most times of the day, but rush-hour congestion is steadily increasing. The commuter train system serving Sussex will eventually extend a line to about four miles from the base, with a possible extension that would come closer to the base. This line is now likely to be among the last parts of the system to be built and will still require a bus connection between Hometown AFB and the station. Even when the system is completed, the vast majority of people commuting to Hometown AFB will continue to have to drive to the base unless bus service is expanded. Congestion on the highways surrounding the base will probably continue to increase even after the system is finished because commuters from outlying areas will not be able to use the system to reach the base. Widening Green Parkway to four lanes near the base will also increase traffic on Elm Avenue leading to the north gate of the base.

A2.5.2. Highway congestion already has a direct impact on Hometown AFB. Morning rush-hour traffic on Route 4 is so heavy that many people living south of the base take back roads to enter the base through the Beech Avenue gate at the south end of the base, even if their final destination is nearer to gates at the north end of the base. To cope with this traffic flow, security police must now direct rush-hour traffic at the intersection of Beech Avenue and Perimeter Road. Although Route 4 and Mason Road are four lanes wide, it takes about 15 minutes longer at rush hour to reach the Main Gate or the west gate from the south via these roads.

A2.5.3. Even more important is the long range potential for conflicts between county growth and aircraft operations. Master plans and related zoning maps developed by Maple Count have been completely revised since the Hometown AFB AICUZ planning guidelines were developed. This is a major step forward. The importance of Hometown AFB to the county is clearly recognized in these plans. Nevertheless, fully implementing these plans by controlling incompatible development will be a formidable task. County officials mentioned at least one successful effort in this area, where a high-rise hotel proposed near the north end of the base was not approved. Similar proposals may have been approved in the past or will be in the future if similar action is not taken.

A2.6. EXISTING CONDITIONS. A survey of land use was undertaken at Hometown AFB to determine existing land use conditions and to identify any problems or conflicts. Table A.2.1. summarizes land use areas by category. Detailed findings for each category are presented below and existing land use areas are graphically illustrated in **Figure A2.2.**

Table A2.1. Existing Land Use.

Category		Acres	Percent of Total
Airfield		605	35.6
Aircraft Operations and Maintenance		26	1.5
Industrial		86	5.1
Administrative		133	7.8
Medical		14	.8
Community Commercial		28	1.6
Community Service		11	.6
Housing			
Accompanied	185		
Unaccompanied	49	234	13.8
Recreation		56	3.3
Open Space		383	22.5
Water		125	7.3
		1701	100.0

Detailed findings about each land use would be provided here, including the condition of facilities, their location relative to similar or linked uses, and conflicts with adjacent uses.

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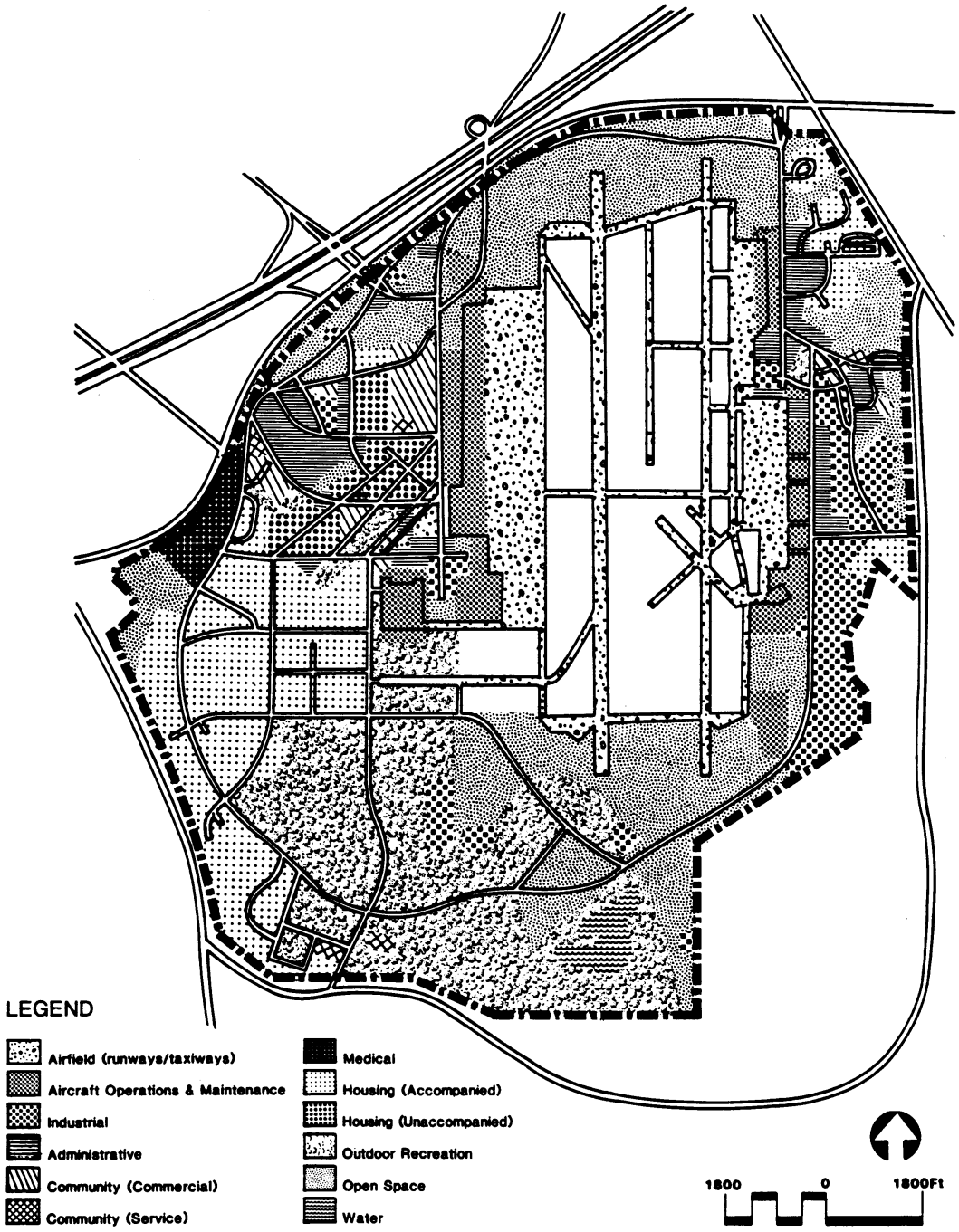
Figure A2.3. Hometown Air Force Base Existing Land Use.



A2.7. CONSTRAINTS AND DEFICIENCIES IN EXISTING LAND USE PLANNING AND DEVELOPMENT AND OPPORTUNITIES FOR THE FUTURE. On the basis of detailed land use surveys undertaken at Hometown AFB, constraints and deficiencies in existing land use planning and development have been identified and are presented in this section. For each land use zone, development factors which weaken or constrain existing uses, conflict with predominant uses, or generally detract from the quality of the predominant land use in the vicinity are noted and described. Major groupings of constraints are included under a common heading to assist in identifying the needs for base-wide planning

initiatives. A constraints/opportunities evaluation is presented to serve as a basis for developing a future land use plan which preserves and strengthens positive land use features, while resolving major land use conflicts.

A2.7.1. A similar analysis is made of the positive features existing on base which should be strengthened and preserved. This analysis overlaps with the previous one in that it also identifies areas on base where redevelopment and/or changes in existing land use are warranted. The analysis is necessarily broad in its approach to avoid encumbering future planning with such detailed considerations as current users of a given area, the existing condition of a particular building or facility, or anticipated changes to existing conditions.

A concise discussion of existing conditions and practices would be provided, showing where there are deficiencies, and where changes are constrained or opportunities for change exist.

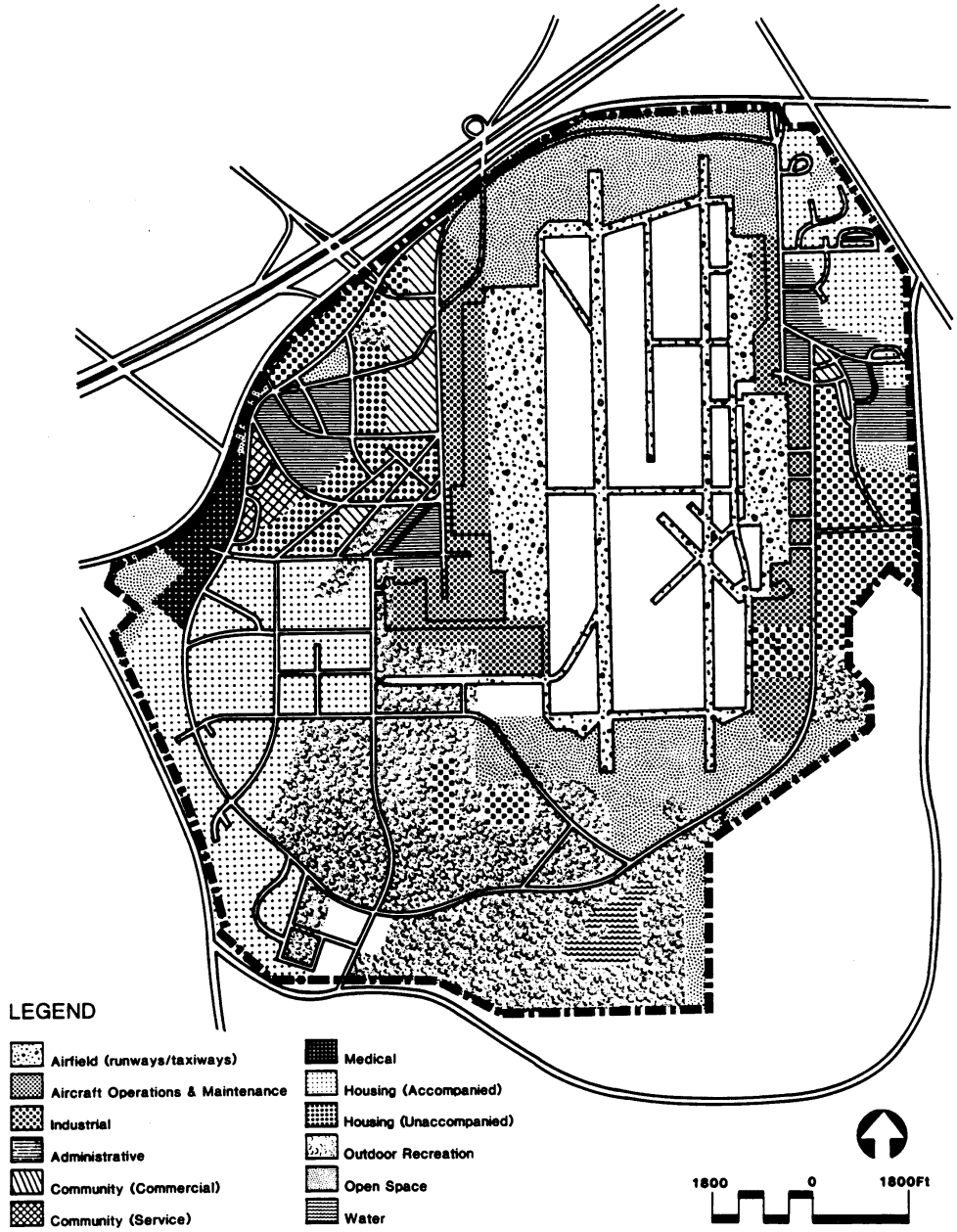
A2.8. FUTURE LAND USE PLAN. **Table A2.2.** summarizes the future land area by category and shows the change from existing conditions. The future land use pattern of Hometown Air Force Base is presented in **Figure A2.4.** The following section discusses in detail the changes in land use recommended by the plan. This discussion also presents the specific capital improvements that will be required to implement the plan**.**

Table A2.2. Future Land Use.

Category	Acres	Change From Existing	Percent of Total
Airfield	605.0	0.0	35.6
Aircraft Operations and Maintenance	31.0	+5.0	1.8
Industrial	87.5	+ 1.5	5.2
Administrative	133.0	0.0	7.8
Medical	15.0	+ 1.0	.9
Community Commercial	32.0	+ 4.0	1.9
Community Service	11.0	0.0	6
Housing			
Accompanied 182			
Unaccompanied 49	231.0	-3.0	13.6
Recreation	60.0	+ 4.0	3.5
Open Space	370.5	-12.5	21.8
Water	125.0	0.0	7.3
Total	1701.0	0.0	

A2.9. THE WEST SIDE OF THE BASE. One of the main land use objectives for the base is to promote the continued development of land use clusters or nodes comprised of functionally related activities. This is particularly crucial for the western part of the base, which is the focus of a lot of pressure for additional space by various users, and which will require a more efficient land use pattern in order to maintain mission effectiveness.

Figure A2.4. Hometown Air Force Base Future Land Use.



A2.10. SPECIFIC RECOMMENDATIONS.

A2.10.1. Expand the community center to include the block enclosed by Westover Drive, Perimeter Road, "G" Street, and Brookley Avenue. This block is currently undeveloped. Locating community commercial facilities here would create a cohesive, fully developed community center complex extending from "D" Street on the south to Perimeter Road on the north along the west side of Arnold Avenue.

A2.10.2. Relocate the temporary living facilities (buildings 1801, 1802, 1803, and 1804) into the accompanied housing area located in the south portion of the base. Convert the above four buildings into dormitories.

A2.10.3. Relocate the exchange service outlet (building 1568) into the expanded community commercial center. This would free this area up for development as an administrative area, consistent with the adjacent Headquarters Command building which will require additional office space in the future.

A2.10.4. The administrative area around the Headquarters building located near the main gate should be expanded eastward to accommodate future demands for administrative space by the Command. It should be noted that at present an industrial use is located immediately east of the HQ building. It should be phased out and the function relocated when the opportunity arises. This would remove an incompatible use. The existing open space in front of the HQ building could be used for additional administrative space. If so, the intent should be to develop a "campus" appearance for this area, given its visibility from the east gate.

A2.10.5. An additional industrial area is proposed along the south side of Perimeter Road opposite the main gate. However, given the types of nearby land uses, and the proximity of this area to the main gate, use of this area should be restricted to "light" industrial uses (i.e., those with a minimum of noise, vibration, odor, etc.) which do not require extraordinary security arrangements. There is an existing water pumping and water storage facility in this area. It is to not feasible or cost effective to relocate these facilities.

A2.10.6. The area between the west and main gates, and between the base boundary and Perimeter Road, is designated for industrial use. At present, this area is occupied by a number of antennas which provide essential communications support. The proximity of these antennas to the base boundary does raise security concerns. For aesthetic reasons, and to provide a buffer, this area should be restricted to only those communications/industrial uses that are consistent with the antennas. It should be noted that the antennas, through constraints imposed by their operating frequency, greatly limit the types of development that can occur near them. Finally, the location of outdoor recreation facilities (e.g., picnic areas, tennis and basketball courts, etc.) should be considered for this area as these uses would not be incompatible with the functioning of the antennas.

A2.10.7. The existing medical area along Perimeter Road in the western part of the base should be retained, and expanded southward across Boston Road into the existing open space area. The existing dental clinic located near the dormitories and the indoor recreation center should be relocated to this area.

A2.10.8. The existing administrative area for on-base functions (e.g., accounting, finance, family support, etc.) should be expanded to include the open space located immediately north of the two structures that presently house the administrative services. This is a prime area in which consideration should be given to constructing a single large building capable of housing compatible administrative activities that are currently scattered throughout the western section of the base. The emergence of an administrative cluster or complex is recommended for this area. This could include linking new and existing buildings with walkways.

A2.10.9. The above administrative area is currently bisected by an old abandoned runway which runs diagonally through it, and which provides parking for the administrative area. It is recommended that the old runway be removed and new parking be provided for the expanded administrative complex.

The north-south street that presently stops at the north edge of this complex should be extended through-it to provide better automobile access to this area. The arts and crafts center located immediately south of the proposed administrative area should be moved into either the administrative area or the nearby recreation complex. This action would eliminate the existing incompatibility of having the arts and crafts center located adjacent to industrial and aircraft operations and maintenance areas.

A2.10.10. The open space located at the southern extent of the unaccompanied housing area is recommended for future development as additional unaccompanied housing. Given the proximity of nearby outdoor recreational space and the indoor recreational facilities, it is not felt that there would be any adverse effects from the conversion of this area to unaccompanied housing.

A2.10.11. It is recommended that the aircraft operations and maintenance area at the south end of the west operational apron be extended eastward to the edge of this apron. This is to accommodate a new hangar proposed for this area. This project is permissible because the existing calibration handstand will be relocated, thus removing the constraint placed on this area by the explosion-quantity arc distance required around handstands.

A2.10.12. Two small additional areas for accompanied housing in the south-western section of the base are proposed. The first is the open space located east of Perimeter Road and south of the proposed extension of the medical center area (which would contain the relocated dental center). A buffer should be provided between the housing and adjacent off-base land uses. The second area is the open space and picnic area located near the youth center.

A2.10.13. The community service center area consisting of the elementary school located in the southern part of the base should be expanded north to Perimeter Road. This would result in the development of a satellite community center serving the southern area of the base. It would consist of community commercial, community service, and outdoor recreational facilities (i.e., the golf clubhouse). It is recommended that additional community commercial activities such as a shopette or laundry be located in this area.

A2.11. THE EAST SIDE OF THE BASE. This section of the base has a much more compact land use pattern due to its smaller land area. Different, and sometimes incompatible, land use types are located next to one another. Competition for space in this area is high because a number of tenant organizations are located here, many of which would like to expand their operations. The challenge of the land use plan in this area is to eliminate existing land use incompatibilities and promote the evolution of a more coherent, logical, and functional land use pattern. Recommendations are presented below:

A2.11.1. The administrative area encompassing the headquarters building of the largest tenant is proposed for expansion along both sides of Fechet Avenue out to the base boundary. The development of an administrative complex in this area should be strongly encouraged. A campus type of setting should be provided for the major tenant. There are a number of housing administrative activities dispersed in semi-permanent buildings that are located behind a major tenant's existing headquarters building. It is strongly recommended that these buildings be demolished and that the administrative functions performed there be consolidated in a new administrative building for the major tenant.

A2.11.2. The mobile home housing located south of Pearl Harbor Drive should be relocated, preferably to the area on either side of Fechet Avenue, due east of the extended administrative area. If possible, space for the mobile homes could also be provided adjacent to the accompanied housing area

located in the northeast corner of the base. It should be noted that mobile home developments are generally not viewed as being compatible with other forms of accompanied housing.

A2.11.3. A small segment of open space running along the small stream located south of the proposed administrative and mobile home areas is recommended for use as a buffer between these areas and the industrial area located immediately to the south.

A2.11.4. The industrial area should be expanded to include the existing mobile home area, and eastward to the base boundary.

A2.11.5. The site of the old landfill, located at the southern edge of the industrial area, is designated as an outdoor recreational area. It is currently proposed that a new rifle range be constructed here, replacing the one now located in the clear zone in the southern part of the base.

A2.11.6. The existing aircraft operations and maintenance area should be retained in its present configuration. At the south end of this area across from the old landfill, an industrial designation is recommended. This is to accommodate a proposed new fire training facility, which would be compatible with the adjacent aircraft operations and maintenance activities.

A2.11.7. The accompanied housing area located in the northeast corner of the base is recommended for expansion. This area should be extended southeasterly along the base boundary toward the small stream which drains the area located due north of Fechet Avenue. Open space should be retained along the stream to act as a buffer between the housing and the administrative complex located immediately to the south.

A2.11.8. The development of a satellite community center on the East Side of the base is recommended. The area around the existing shopette and swimming pool should be extended southward to accommodate a facility containing such uses as a restaurant, laundry, barbershop, and other conveniences. Relocating the base civil engineer administration office into the new administration area would make the southernmost part of this new community center area available for that use.

A2.11.9. The outdoor recreation and open space area located immediately west of the proposed satellite community center is recommended for use as an administrative area.

A2.11.10. The area south and west of the existing skeet range should be developed for outdoor recreation. This includes the provision of ball fields, tennis courts, etc.

A2.11.11. The area south of Perimeter Road to the base boundary, including the area around Base Lake, should also be kept as an outdoor recreation area. The existing open space between the road and the lake should be used for playing fields, tennis courts, etc. Trails should be developed in the wooded area located southeast of Base Lake.

Attachment 3

LONG-RANGE FACILITIES DEVELOPMENT PLAN

The result of the development of the future land use plan is specific recommendations for scheduling and completing capital facilities projects that will be necessary in order to ensure achievement of the desired future land use plan. Once again, boxed segments of this appendix are addressed to the reader.

A3.1. HOMETOWN AFB LONG-RANGE FACILITIES DEVELOPMENT PLAN. As a result of the base comprehensive plan, and in particular the land use plan and transportation plan components of the comprehensive plan, a long-range facilities development plan has been developed to implement these facilities- related aspects of the land use plan. The implementation strategy of the land use plan will rely on this facilities development plan to implement physical changes over the next five-year period**.**

Appropriate reference would be made to each recommendation of the land use plan, or each recommendation would be summarized here. A priority would be established among the recommendations in order to establish a development schedule.
Factors affecting the ranking will be:
Urgency of a deficiency or a hazardous condition.
Availability of funds for each category of facility.
Logical sequence of demolition, site clearing, construction, and temporary quartering of activities during interim phase of land use plan.

A3.2. An analysis was made, in consultation with the base civil engineer, base community planner, affected users and tenants, and others, of the interim sequence of events necessary to achieve each recommendation. Critical linkages were established (where one event has to precede another) to ensure that the interim period until the plan is fully implemented would create as little disruption as feasible. The resulting plan calls for an orderly sequence of permanent and temporary relocation’s, selected demolition’s, and new construction.

A3.2.1. For each facility a detailed plan, showing preceding critical and non-critical events and duration of each stage, is provided below.

A3.2.2. A capsule plan for each facility's development should be made, and related to a master plan and schedule.

A3.2.3. In addition to a priority list, the long-range facilities development plan should have a time schedule for each event so that a facility's improvement or development can be coordinated with all other events in the implementation phase. It would be useful to maintain an annual demolition/construction plan on a C-1 map in conjunction with the written plan.

Figure A3.1. Project Schedule: Integrated Repair, Overhaul, and Maintenance Facility.

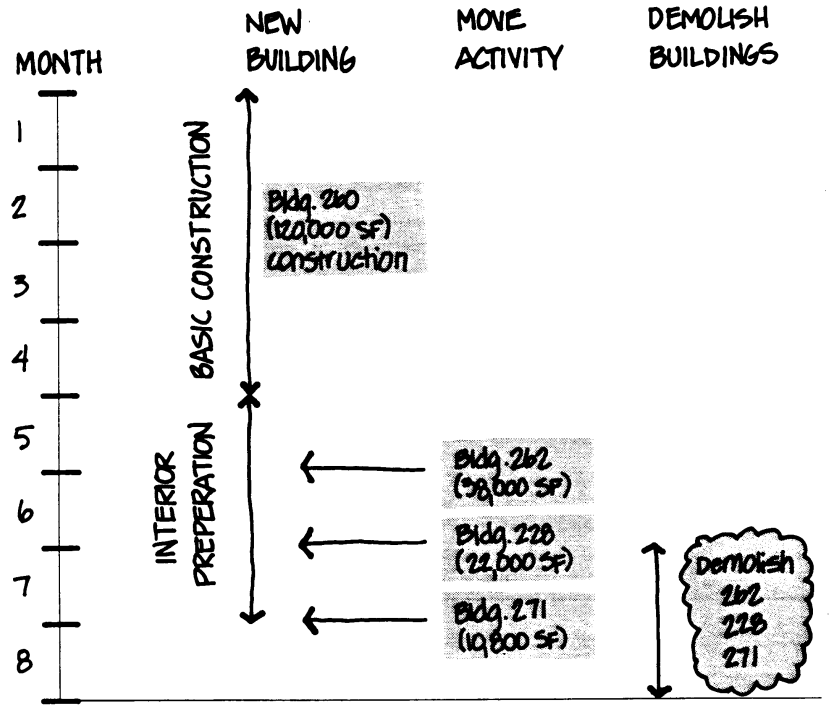


Table A3.1. Hometown AFB Facilities Priority List.

(FY 88-92)

PRIORITY	FY	ITEM	SCOPE	COST ($000)	PRIOR 5 YEAR PROGRAM	CAT CODE
1	88	Accounting & Finance	43,800 SF	5,050	88	610-249
2	88	Air Freight Terminal	35,900 SF	2,950	89	141-782
3	88	Squadron Operations	9,200 SF	1,650	NEW	141-753
4	88	Energy Security Improvements	LS	2,800	NEW	812-225
5	88	Fire Protection Systems	LS	2,750	NEW	880-221
6	88	Corrosion Control Facility	2,950 SF	850	NEW	211-159
7	89	MWR Support Facility	13,400 SF	850	89	740-672
8	89	Alter Sewer System	LS	1,100	89	832-266
9	89	Airmen Swimming Pool	13,400 SF	1,500	91	750-813
10	89	Fire Station	6,800 SF	1,050	90	730-142
11	89	Add to A/C Engine Shop	8,100 SF	1,050	91	211-157
12	89	Education/Family Support & Lib	37,000 SF	4,400	91	730-441
13	90	Petroleum Operations Complex	4,500 SF	2,000	91	121-111
14	90	BCE Shop	47,400 SF	5,700	91	219-944
15	90	Non-Destructive Insp. Shop	5,500 SF	850	91	211-153
16	90	Consolidated Admin. Facility	55,000 SF	7,100	NEW	610-811
17	91	Unaccompanied Enlisted Housing	500 PN	9,600	91	721-312
18	91	Heat Plant	525 MBTU	49,500	91	821-116
19	91	Medical Center Alterations	410,000 SF	90,000	90	510-001
20	91	Composite Wing/Division HQ	46,000 SF	4,600	NEW	610-249
21	92	Gymnasium	24,000 SF	3,600	89	740-674
22	92	VOQ/VAQ	410 PN	20,100	91	724-417
			TOTAL	219,050		

Attachment 4

MODEL STATEMENT OF WORK FOR A CONTRACTED LAND USE PLAN

A4.1. The Land Use Plan. The Land Use Plan component of the base comprehensive plan should contain a complete description of current and future conditions on the base. The plan should include graphics suitable to this purpose. The Land Use Plan will vary according to the needs and conditions at each Air Force base, but it should contain, at a minimum:

Introduction and regional orientation;

Statement of goals and objectives;

Functional relationships analysis;

Description of existing conditions;

Identification of problems. constraints, and opportunities;

Development and review of plan alternatives;

An evaluation of alternatives;

A recommended plan;

A plan implementation strategy; and

Sufficient graphics to enable clear understanding of the findings, process, and results.

These sections of the Land Use Plan should take the reader through an orderly sequential process of understanding the context for the plan, the approaches used, what was found to exist, alternative plan elements, and the final plan and its implementation.

A4.2. Introduction. The introduction should describe the purpose of the land use plan, the base location and relation to the surrounding region, points of contact on base, a summary of the base needs, and highlights of the recommended plan. A person reading only the introduction should be able to understand the primary elements of the plan.

A4.3. Goals and Objectives. Overall land use goals and objectives should be presented. These guide the Land Use Plan's development and ensure the plan is in concert with the Comprehensive Plan.

A4.4. Functional Relationships. The work involved should begin with an examination of the functional relationships among uses. The identification of functional relationships requires coordination among a broad range of base activities.

A4.5. Existing Conditions. Existing land uses and their condition, location, and relation to each other should be clearly described. The narrative should cover the important aspects of each land use category. Tables should be used to summarize important data and an existing land use and condition map should be prepared.

A4.6. Problems, Constraints, and Opportunities. Describe the current problems, constraints, **a**nd opportunities identified during the existing conditions inventory. Include a detailed description of what the problems are and the probable causes. Describe any physical, environmental, legal, and other con-

straints on planning or development. Also, identify existing facilities or conditions that provide opportunities for improved land use. Include off-base problems and opportunities to the extent that they will affect planning on base.

A4.6.1. Prepare a map showing locations of problems and opportunities along with a short narrative of each that is number-keyed to the map. Where feasible, forecast potential future problems resulting from land use or mission changes. Indicate future problems on the same map using a special color or symbol, or by means of an overlay.

A4.7. Alternatives. For each current and future problem/opportunity describe the feasible alternatives that were considered. Use a tabular format to clearly display alternatives. Prepare sketches of alternatives, particularly changes that are otherwise difficult to visualize. These might include physical alterations such as road realignments, demolition, and construction alternatives.

A4.8. Evaluation of Alternatives. Evaluate the alternatives and describe how this evaluation was done and the results for each problem or opportunity identified. Include a list of criteria and standards used for evaluation purposes. Provide tables showing the comparison of alternatives. Conclude with a ranking of all alternatives.

A4.9. Recommended Land Use Plan. Describe the land uses and their configurations that are needed to meet current and future base requirements. Prepare a map showing the future plan with short-term and long-term recommendations. Use appropriate colors, patterns or symbols to differentiate between the short-term and long-term. Include a table describing the recommendations, keying each to the map.

A4.9.1. Prepare a table showing estimated total cost to implement the short-term and long-term facility development projects. For the short-term (five-year) facility development projects, prepare yearly cost estimates that will be considered along with other base needs for inclusion into the Capital Improvement Program.

A4.10. Plan Implementation. Describe steps that should be taken to implement the recommended projects. Include coordination needed among base personnel and off-base agencies. Develop specific policies, programs, and projects that will implement the future land use plan.

A4.10.1. To the extent possible, also describe known off-base projects that will influence the installation. Provide illustrations or maps to supplement the narrative.

A4.11. Graphics. Graphics and tabular display of data are significant parts of the plan. Maps show geographical relationships that are difficult to describe in text. They are also vital to understanding functional relationships, and the proposed changes from existing conditions to the future planned, conditions.

A4.11.1. All contracted work should be clearly outlined prior to execution, and the responsible Air Force personnel should monitor progress and concur in important assumptions and decisions.

Attachment 5

LAND USE CATEGORIES

A5.1. Land Use Categories, Colors, and Patterns.

Category	Color	Pattern*
Airfield	White	
Runway/taxiway/apron	Brown	
Industrial	Gray	
Administrative	Orange	
Community (Commercial)	Red	
Community (Service)	Pink	
Medical	Violet	
Housing (Accompanied)	Yellow	
Housing (Unaccompanied)	Yellow Ocher	
Outdoor Recreation	Dark Green	
Open Space	Light Green	
Water	Light Blue	

*To Be Used For Black And White Or Reproducible Copies.

A5.2. Facility Types by Land Use Category. The following list of facilities is not all-inclusive, but is meant to provide examples of the types of facilities found in each land use category.

Airfield

- Runway
- Overrun
- Taxiway
- Apron
- Arm/disarm pad
- Various navigational aids/air traffic control facilities.

Aircraft Operations and Maintenance

- Aircraft Hangar
- Aircraft Organizational Maintenance
- General Purpose Shop (A/C)
- Maintenance Control Office
- AGE Shop Maintenance
- Engine Shop
- Fuel Maintenance Dock
- Corrosion Control Facility
- NDI Shop
- Avionics Shop
- Field Training Detachment (on flightline)
- Base Operations
- Crew Readiness Facility
- Helicopter Operations
- Control Tower
- Weather Facility
- Munitions Load Crew Training Facility
- Fire Station-Crash/Rescue
- Air Freight Terminal
- Squadron Operations/Flight Training
- Aircraft, Wash Rack
- Sound Suppresser
- Aircraft Maintenance
- Missile Launch Sites
- Radar/Aircraft Guidance Systems
- Primary Radar Station Facilities

Industrial

- Base Supply Administration
- Warehouse, Supply & Equipment
- Shed, Supplies & Equipment
- Open Storage, BCE
- Commercial Transportation
- Vehicle Operations Administration
- Vehicle Maintenance Shop
- Refueling Vehicle Shop
- Vehicle Parking Shed
- Vehicle Operations Parking
- Heating Plant
- Central Refrigeration Plant
- Sanitation Facility
- Flight Simulator
- Water Facilities
- Fire Station-structural
- Locomotive Maintenance
- POL Operations Building
- Truck Fill Stand
- Fuel Storage
- Operating Storage
- Field Training Detachment (SPs)
- Small Arms Training
- Small Arms Range
- Vehicle Operations Storage
- Vehicle Wash Rack
- Open Storage, LGT.
- Base Engineering Administration
- BE Maintenance Shop
- BE Covered Storage
- BE Storage Shed
- BE Pavements & Grounds
- BE Open Storage
- Communications Maintenance Facilities
- Test Cell
- Disaster Preparedness
- Fire Training Facility
- Kennel Support
- Reserve Fire Team Facilities
- Base Printing Plant
- Armament Maintenance/Storage
- Photo Lab

MARS Radio
Electric Substations
Survival Equipment Shop
Other Utility Facilities
Weapons/Munitions Storage Area
Various Research Facilities/Labs

Administrative

Audio Visual Facilities
Television Production Center
Education Center
Social Action Facilities
Wing/Group Headquarters
Area Defense Council Office
Law Center
Command Post
Telecom Center
CPBO
Civilian Personnel
Family Services
Family Housing Management
Red Cross
Warehouse, Forms & Publications
DCO Staff
DCM Staff
SP Group Headquarters
Security Operations
Central Security Control
SP Control & ID
Traffic Gatehouse
Data Processing Plt.

Community(Commercial)

Clothing Sales
Bank
Credit Union
Thrift Shop
Commissary
Cold Storage
Exchange Branch
Exchange Cafeterias
Exchange Service Station
Exchange Laundry
Exchange Sales Store
Exchange Service Outlet
Exchange Warehouse
Exchange Maintenance Shop
Exchange Administration

Clubs/Dining

Airmen’s Club
NCO Club
Officers' Club
Airmen’s Dining Hall
Dry Storage, DH Support

Indoor Recreational

Gym
Fieldhouse
Theater
Bowling Center
Recreation Center
Arts-Crafts Center
Auto
Youth Center

Community (Service)

OTHER COMMUNITY FACILITIES

Post Office
Library
Child Care Center
Chapel
Religious Education Center
Education Center

Medical

- Veterinarian Facility
- Hospital & Dental Clinic
- Medical Storage

Housing (Accompanied)

- Family Housing
- TLF
- TLF Support
- Trailer Court

Housing (Unaccompanied)

- Bachelor Housing
- BOQ
- UEPH
- Visitor Housing
- VOQ
- VAQ

Outdoor Recreation

- Tennis Courts
- Baseball, Junior Fields
- Football Fields
- Track
- Softball Fields
- Recreation Court
- Recreation Pavilion
- Golf Course
- Golf Clubhouse
- Outdoor Drill, Training Areas
- Riding Stable
- Outdoor Pool
- Swimmers' Bath House
- Fam Camps
- MWR Supply/Storage
- Outdoor Ranges
- Parks/Picnic Areas
- Beaches

Open Space

- Conservation areas, forest stands, grazing areas.
- Required buffer space--safety clearances, security areas, utility easements.

Water

- On-base ponds, lakes, major streams.

Attachment 6

ANNOTATED BIBLIOGRAPHY

Beaujeu-Garnier, J., and Chabot, Georges. 1967. Urban Geography. London: Longmans, Green and Co, Ltd. Geographies for Advanced Study.

Urban geography is a science of comparatively recent origin that is concerned with the nature and function of towns, with their situations and sites, their relations with each other and with the countryside, their plans and planning problems, and the people who live in them. Its development as a branch of geography has taken place mainly in the post-war period, and although there is already a vast amount of written material on the subject. This book provides an up-to-date summary of the main facts and theories of urban geography. It is designed for students of urban geography and for all who are concerned with the problems of cities and who see in them the main element in all regional organization.

Conway, H. M., and Liston, Linda L. 1976. Industrial Facilities Planning. Atlanta: Conway Publications, Inc.

This book is a complication of useful and significant studies in the field of corporate facility planning and location. The material was chosen, excerpted and presented in a fashion designed to serve today's facility planners in handling new projects for the future. This volume includes a comprehensive subject index, as well as an appendix containing a detailed checklist of site location factors.

De Chiara, Joseph, and Koppelman, Lee. 1969. Planning Design Criteria (Second Edition). New icrk: Van Nostrand Reinhold Co.

Basic reference material provided here presents a variety of data and standards related to land planning and site design. Topics include master planning and land use principles, housing, vehicular circulation, recreation, and industrial development. Illustrated.

Departments of the Army, Navy and Air Force. October 1975. Planning and Design of Outdoor Sports Facilities. Army The 5-803-10, Navy NAVFAC P-457, Air Force AFI 68-33.

This manual provides a comprehensive reference source for outdoor sports facilities that contains information required for the planning and design of these facilities. Information is provided for site adaptation in an outline text of planning and design criteria opposite an accompanying page of definitive drawings. The scope of this manual covers outdoor sports and games most commonly played for competition and/or recreation by military and civilian personnel.

Detwyler, Thomas R., ed. 1971. Man's Impact on Environment. New York: McGraw Hill Book Company.

Man's Impact on Environment substantiates the wide spectrum of environmental changes wrought by man, focusing on major processes of change, immediate and extended-effects on the environment, and trends in time and space of processes and effects. Taken together these articles provide a meaningful overview of the present quality of man's environment and the causes for this condition.

Gold, Seymour M. 1980. Recreation Planning and Design. New York: McGraw Hill Book Company.

This book describes the process and products of urban recreation planning. The focus is on basic concepts. measures, methodology and the park and recreation plan. The goal of the book is to improve the quality of life and environment by the provision of better parks and more recreational opportunities.

Lochmoeller, Donald C., and others. 1975. Industrial Development Handbook. Washington D.C.: The Urban Land Institute. Community Builders Handbook Series.

The principal purpose of this Handbook is to help communities and developers achieve better planned work centers for the production and distribution of goods. As such, this Handbook is addressed to four groups of readers, all of whom are decision makers who shape the physical form and economic future of the community: the development community, government bodies, industrial management, and the public.

Martin, Thomas, and others. 1978. Adaptive Use. Washington, D.C.: The Urban Land Institute.

This book is intended as a supportive guide to those who would undertake adaptive use--converting a building originally designed for one purpose to a different and contemporary use--projects. It contains an overview of the economics and process involved in such projects, 15 detailed case studies of specific projects, and profiles of many other projects categorized according to the type of structure being adapted.

McKeever, J. Ross. 1970. Business Parks: a Study of Development Practices and Procedures. Washington, D.C,: The Urban Land Institute. ULI Technical Bulletin 65.

This report is a sequel to ULI's bulletins on residential, shopping center, and industrial types of planned unit development. In the planned unit concept, the developer proceeds under a master plan. This plan predetermines the land uses, relationships among the buildings, open spaces and common facilities. The study is based directly on responses received from a questionnaire form of inquiry addressed to ULI members. Indirectly, the study includes pertinent findings from several previously published reference sources. By these means, the study is directed toward practical experiences from known developments.

McKeever, J. Ross, and Griffin, Nathaniel M. 1977. Shopping Center Development Handbook. Washington, D.C.: Urban Land Institute. Community Builders Handbook Series.

Throughout, the discussion in this book focuses on recommended practices and standards of excellence. As shopping centers have developed, several clearly identifiable types have been defined. We now see three major categories: the neighborhood, community, and regional centers. The super-regional center can reasonably be considered a fourth category. although it differs from the regional center only in magnitude. These categories are not precise, and patterns are still evolving. Special markets have stimulated the development of a variety of special kinds of shopping centers that do not quite fit traditional definitions. The most glamorous of these are now being referred to simply as theme centers or specialty centers. The search for the shopping center of strikingly unusual character has also led to the adaptive reuse of existing buildings as shopping centers, adding another facet to the complexities of analysis and description. Each of these types is described in detail. A series of case studies fully addresses current practices in shopping center development. The Shopping Center Development Handbook contributes to the understanding of shopping centers as one of the most important land use elements in community development.

New Jersey County & Municipal Government Study Commission. October 1974. Housing and Suburbs: Fiscal and Social Impact of Multifamily Development. Trenton, New Jersey: State of New Jersey.

This study was undertaken in an effort to identify the dimensions of the impact of housing development on the communities in which it takes place, and to develop proposals and directions through which reasonable municipal interests can be reconciled with the need for provision of housing and for orderly development of areas in which growth is likely to take place. To do so, the authors looked not only at the revenues and expenditures associated with multifamily housing development, which was the initial thrust of the research, but also at the social and economic characteristics of housing residents, their attitudes and

interaction patterns; at local decision making and the underlying legal principles and practices, and the perceptions and attitudes of local political and civic leaders.

Office, Chief of Engineers (HQ USACE). Department of the Army. l March 1981. Installation Design Manual. Army TM 5-803-5, Navy NAVFAC P-960, Air Force AFM 88-43.

The objective of the Installation Design Manual is to provide guidance for improving the quality of the visual environment of Army, Navy and Air Force installations. The guidance offered in this manual is for use by Army, Navy and Air Force personnel responsible for installation planning and design as well as design firms, particularly those offering comprehensive architectural planning and engineering services, that are under contract to plan and design military installations or facilities. The Installation Design Manual is a tool to improve the appearance and functioning of military installations by enhancing natural site assets; compatibly relating the natural and built environments; establishing an orderly organization of activities, circulation and open space system; achieving a consistent architectural character; and coordinating site components such as lighting, signing and street furniture to reduce clutter. This manual includes information gathered from a variety of sources and is intended to serve as a comprehensive reference of design guidance for military installations.

O'Mara, W. Paul., and others. 1978. Residential Development Handbook. Washington, D.C.: Urban Land Institute. Community Builders Handbook Series.

The Community Builders Handbook first appeared in 1947. The basic precepts that led to the acceptance of the original Handbook as a standard working manual on development principles and practice are followed in the preparation of the Residential Development Handbook. The text and illustrations reflect trends in residential development together with the current practices of the Residential Council. The primary objective of this Handbook is to describe current practices in residential development: market and feasibility analysis, financial analysis, site selection, site design, marketing, and rehabilitation. A chapter on future trends rounds out the discussion.

The report indicates that low-density sprawl development is more costly in terms of environmental effects such as air and water pollution and energy consumption than higher density developments. This study is an analysis of prototype development patterns and not of actual developments, although empirical data were used.

Smart, Eric J., and others. 1981. Recreational Development Handbook. Washington, D.C.: The Urban Land Institute. Community Builders Handbook Series.

This handbook focuses on real estate development that is distinguished by recreational elements that provide income and add value to associated real estate. It is designed to be a how-to guide for those interested in one or more of the many aspects of this type of development. The subject is discussed both in a general sense and by specific development type.

Strandgaard, Torben. 1975. Residential Site Planning Guide. Washington, D.C.: National Association of Home Builders.

This guide is a "primer" to give builders, developers and interested lay people a basic understanding of residential site planning. With current public concern over environmental issues and with increasing community demand for quality control in project development, good site planning must become an integral part of the overall objectives of the builder/developer. As the demand for good neighborhood planning increases, new approaches and better solutions are needed in the design of communities. A better mix of housing types, improved open space planning, more imaginative landscape architecture, properly planned

circulation systems, and well-designed community facilities are vital aspects of a good development plan. The arrangement of these elements within the project and the process by which decisions are made are the main topics of this book.

United States Department of the Interior. February 1978. National Urban Recreation Study: Executive Report. Washington, D.C.: U.S. Government Printing Office.

This report summarizes studies of large and small cities, old and new cities, core cities and suburban areas. These studies indicate that the recreation systems in our cities vary widely in quality and yet share certain common characteristics.

Whitaker, Ben, and Browne, Kenneth. 1973. Parks for People. New York: Schocken Books.

This book, the authors of which are English, provides a very different perspective for those concerned with American cities. The three central points of the book are that public parks are basic to the health and welfare of any community; that planning is a complex process influenced by the interaction of related social, cultural, economic, and political factors; and that the aesthetic, artistic aspect of park design has become too important even as the scientific elements of planning have declined. The authors have attempted to translate the forms of more than a century of Anglo-American environmental tradition into the various processes by which much of the parkland in England and the U.S. was created.

Whyte, William H. 1968. The Last Landscape. Garden City. New York: Doubleday and Company. Inc. (Anchor Books)

This book is about the way our metropolitan areas look, and the way they might look. It deals with the political realities of open space and the conflicting demands that are placed on it, the planning of space, how the need for development relates to the need for open space and the pros and cons of cluster development and the landscape and how to improve it.

Williams, Edward A., and Massa, Alison K., in association with Blair, David H., and Schaal, Herbert R. 1983. Siting of Maior Facilities: A Practical Approach. New York: McGraw Hill Book Company. Sponsored by EDAW.

This book describes a systematic and comprehensive process for selecting sites for major facilities. From freeways to power plants and military installations, major facilities have rarely met with a smooth passage from concept to construction. Poor siting decisions have far-reaching effects on the natural environment, on individuals and communities, and on the economy. The goal of this book is to improve site-selection decision making. It is more possible today than it was 10 or 15 years ago to cite cases that illustrate the use of systematic siting methods. This book presents examples. Targeted toward industry, government, and the affected or interested public, it provides a thorough understanding of the comprehensive nature and impacts of the process. By presenting one structured and broadly applicable process, it advances far toward its goal of providing the means for making major Siting decisions more rationally, more quickly, and more economically. It also offers facility information of considerable value to the land use planner.